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ABSTRACT

This book offers strategies to help teachers and curriculum coordinators strengthen student interest through meaningful and purposeful learning. The 15 chapters are: (1) "Introduction: Planning a Connected Curriculum"; (2) "Children, School, and Community"; (3) "On Connections"; (4) "Making Connections: An Interdisciplinary Approach"; (5) "Making Meaning: What is it All About?"; (6) "How to Overcome Common Objections to Connected Teaching"; (7) "Making Connections through Technology"; (8) "Making Connections through the Arts"; (9) "Making Connections through Writing"; (10) "Making Connections across Science, Technology, and Society"; (11) "Making Connections through Curriculum Design and Assessment for Meaningful Instruction" (12) "Making Connections through Expeditionary Learning"; (13) "Making Connections through Assessment"; (14) "Marching to a Different Drummer?" and (15) "Practical Suggestions on Using This Guide." Each chapter attempts do describe why it is important to student learning, how the teacher can adapt it to the classroom, and how it redefines the teacher's role. Chapters contain best practice profiles. (Contains 65 references.) (SM)

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Foreword

Students learn best when they are interested in subject matter and when they see connections to their own lives. *Planning a Connected Curriculum* offers many strategies to teachers and curriculum coordinators that strengthen student interest through meaningful and purposeful learning. The book was written by educators for educators, and all proposed strategies have been used successfully in Wisconsin's classrooms.

One of the greatest challenges in curriculum design and instructional practice is to strike a healthy balance between an emphasis on separate school disciplines and the connectedness of knowledge and learning. Learning gains depth if this balance is established through connections across school disciplines; connections between content and learner, between school, community, and student; and connections between classroom assessment and student progress. *Planning a Connected Curriculum* discusses approaches to all of these different types of connections.

Perhaps one of the greatest contributions of this book is its emphasis on the importance of all curricular areas to the education of our students. *Planning a Connected Curriculum* illustrates how the inclusion of areas such as creative and expressive writing, music, or art contributes to student achievement in other subject areas. We cannot and should not reduce the curriculum to those areas that fall under federal accountability measures.

Finally, this book directly correlates with teacher licensing standards. It sees teachers as reflective practitioners who understand concepts and structures in their disciplines and who create learning experiences that make subject matter meaningful for students. *Planning a Connected Curriculum* provides a foundation for teachers to work toward meeting the expectations in teacher licensing standards.

I sincerely thank the task force members, who contributed many hours of thoughtful work to this book. I am proud of these educators who routinely and generously give their time and expertise to advance the teaching profession in their state. Their service directly benefits all of the students in Wisconsin's schools.

Elizabeth Burmaster
State Superintendent

Writing Task Force

This team of educators worked tirelessly on the drafting and completion of *Planning a Connected Curriculum*. Their extraordinary commitment to improving connected teaching and learning has made this book possible. The Wisconsin Department of Public Instruction is highly appreciative of the strong tradition of Wisconsin's educators who continue to share their expertise with their professional community. Our students benefit from their work.

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Introduction

Planning a Connected Curriculum

1

American education reformers have embraced the concept of a connected or integrated curriculum for over one hundred years. Many well-intended proposals have been made, but most of them have not made it into mainstream education.[1] Why is it so hard to implement connected curricula in the schools? The answer is most likely that learning and teaching across the curriculum goes against the organization and structure of today's schools. The American school system is based on models of efficiency and separation of skills that gained prominence in the early twentieth century. Education followed the lead of business and industry throughout the transformation from agrarian to urban industrial society (Cremin 1964; Kliebard 1995). Can we continue schooling in the industrial model? Can we continue to provide an education to students, pretending that disciplines are completely separate from one another? Can we ignore our students' desire to make what they learn relevant to their lives? Can we ignore society's current transformation, this time from an industrial to an information-and-knowledge-based society? The answer to all these and similar questions is most certainly no.

Although massive reform can be overwhelming, we can take small steps within the existing system and assist teachers to implement connected and meaningful learning within the existing structures of our education system. Although the Wisconsin Model Academic Standards were written for separate disciplines, careful analysis of those standards shows many areas that open up the curriculum to cross-disciplinary teaching (Governor's Council on Academic Standards 1998). The main purpose of this guide is to offer practical advice and proven strategies to connect the curriculum in this era of standards-based education. The guide was written by educators for educators. More importantly, all suggestions and strategies in the book have been tried out successfully in Wisconsin's classrooms.

The book was primarily written with students in mind. They need a coherent, relevant, research-based approach that connects elements of lesson design, learning theory, interdisciplinary teaching, performance assessment, technological literacy, and academic standards. We have outlined the steps that you can take to improve student learning through connections.

We are not arguing for teachers to add to their curriculum and cover more topics. Quite the contrary, we strongly believe that more can be taught and learned in less time if we connect the disciplines. Curriculum connections often eliminate duplication.

More can be taught and learned in less time if we connect the disciplines. Curriculum connections often eliminate duplication.

---

[1] For a discussion of different models of integrated and connected curriculum see Wisconsin Department of Public Instruction 1997.

In many cases, these recommendations mean doing more of what you currently do well. Other suggestions necessitate a rethinking and letting go of traditional classroom practices.

In writing this guide, the authors have been well aware of the increasing responsibility and accountability for teachers. State-mandated assessments, curriculum alignment with content and performance standards, and Individuals with Disabilities Education Act (IDEA) compliance have increased demands on time, energy, and professionalism. Reduced budgets for education further complicate the picture. What is proposed in this document is not a way to make teaching easier. If you adopt some of the suggestions, however, your work will lead to more lasting, meaningful student learning.

Throughout this guide we will touch upon a myriad of related topics that teachers are addressing or will be asked to address in the immediate future. They include the following:

- Creating inspiration and purpose for lifelong learning
- Connecting teaching and learning through technology
- Making assessment meaningful and relevant to student learning
- Connected teaching strategies and models, including brain-based teaching and learning strategies
- Linking insight, imagination, and critical thinking
- Redefining our concept of schooling
- Connecting the standards

Each chapter is designed to make an impact in your classroom. As a result, this guide is long on practice and relatively short on theory. The reason for this is simple: Nothing in this guide is novel or unique. These are not new ideas, but they represent a new way of linking and drawing relationships among segmented pieces of curriculum or subject matter. As you read, you may recognize much of what is discussed. If so, you know the power of connected teaching and now may consider incorporating more into your practice.

At the beginning of each chapter you will find a chapter summary. Each of the chapters attempts to answer three questions:

- Why is this important to student learning?
- How can I adapt this to my classroom?
- How does this redefine my role as teacher?

Also included in the design of different segments are illustrations and graphic organizers to assist you in making sense of the material. Throughout you will also find white space to encourage you to write down your own thoughts and reflections. Without these commentaries, this book will remain incomplete.

The following are brief chapter summaries. Taken individually, these chapters may correlate to specific concerns or priorities that are part of your district's curriculum revision process or your school's improvement plan. Collectively, they provide a concise, functional framework for rethinking what we do in our classrooms.

CHILDREN, SCHOOL, AND COMMUNITY

Learning is deeper when it is connected to real-world situations and to the expectations of the entire school community. This chapter discusses community expectations of all students in a climate of constant change and technological innovations and asks if a school curriculum can still be designed as a simple, fixed, and linear sequence.

ON CONNECTIONS

This section establishes the need for connecting content and learner. Static views of learning are challenged by a discussion of connections ranging from Boyer's proposals for a thematic organization of the curriculum to a brief reflection on the unity of knowledge and learner. Several approaches to connecting the curriculum are described. Subsequent sections further elaborate on the issues discussed here.

MAKING CONNECTIONS: AN INTERDISCIPLINARY APPROACH

This personal essay proposes the integration of literature and social studies and was first published as an introduction to a textbook. The author speaks from her own successful experience teaching integrated units.

MAKING MEANING: WHAT IS IT ALL ABOUT?

Eight principles for connected learning provide the basis for practical classroom suggestions. The emphasis lies on the importance of connecting information and knowledge with personal experience and real-world applications for better student performance. Readers are invited to reflect on their own practices and to add to the list of learning strategies.

HOW TO OVERCOME COMMON OBJECTIONS TO CONNECTED TEACHING

Objections to connected teaching often have to do with lack of time or lack of collegial relationships as well as with an impression that state standards and assessments lead to fragmentation. This chapter makes suggestions for resolving these objections and working toward connected teaching and learning that sees standards and assessments as an opportunity, not an obstacle.

MAKING CONNECTIONS THROUGH TECHNOLOGY

Technology has changed the ways in which we access information as well as how we process information into knowledge. This chapter addresses some of the challenges and opportunities for teaching, learning, and the organization of schools that arise from a constantly changing technological environment. The main argument is that modern communications technology changes roles of students and teachers dramatically.

MAKING CONNECTIONS THROUGH THE ARTS

The arts are not seen as simply another school discipline in this essay. The discussion centers on the question what contribution aesthetics makes to cognitive learning. The arts should not be separated from other disciplines—they contribute across the curriculum.

MAKING CONNECTIONS THROUGH WRITING

Writing is a way of knowing and connecting, not just a tool for communication. Using writing to express personal experience helps students to reflect and to learn about themselves.

MAKING CONNECTIONS ACROSS SCIENCE, TECHNOLOGY, AND SOCIETY

Science and technology have a significant impact on society. This chapter examines ways in which students can learn in cross-disciplinary, connected, and conceptual ways. State standards make these connections across the curriculum possible.

MAKING CONNECTIONS THROUGH CURRICULUM DESIGN AND ASSESSMENT FOR MEANINGFUL INSTRUCTION

This section outlines the curriculum-planning process through guiding questions, essential understandings, and conceptual lenses. The message is clear: Students will be challenged intellectually if the curriculum is organized and connected around concepts. Assessment practices then follow this premise. Even though the examples have been taken from the elementary grades, the described processes are just as valid for middle and high school.

MAKING CONNECTIONS THROUGH EXPEDITIONARY LEARNING

This article was submitted by Thomas Van Winkle, former principal at Winnequah Middle School in the Monona Grove School District. Winnequah is an Expeditionary Learning Outward Bound School where curriculum is integrated through learning expeditions. This approach to connected learning challenges students and teachers intellectually, physically, and emotionally. Learning, therefore, becomes a holistic experience.

MAKING CONNECTIONS THROUGH ASSESSMENT

This chapter looks at different types of assessment through the lens of balance. Assessment should balance traditional and performance-based approaches because different types of assessments serve different purposes. A discussion of Arts Propel describes an integrated approach of instruction and assessment. Many of the assumptions about connected learning introduced throughout this book are reinforced in this section.

MARCHING TO A DIFFERENT DRUMMER: WHAT DOES THE FUTURE HOLD?

We are on the brink of some dramatic changes in teaching and learning, some of which have been and will continue to be affected by changes in communications technology. Changes in the medium of delivery have always had significant impact on message and content. What lies ahead of us? Join us in reflecting on sketching out possible future developments.

BEST PRACTICE PROFILES

Descriptions of best practices are inserted as separate sections throughout the book. They illustrate a wide range of connected teaching and learning strategies.

Children, School, and Community

2

Learning is deeper when it is connected to real-world situations and to the expectations of the entire school community. This chapter discusses community expectations of all students in a climate of constant change and technological innovations and asks if a school curriculum can still be designed as a simple, fixed, and linear sequence.

The first day of school is an exciting day for parents, teachers, and first and foremost for the children. Children walk in to their classrooms full of curiosity, not really knowing what school is all about. The transition in their lives is enormous.

The first day of school marks the beginning of formal education for most children, but it is not their first experience with learning. These children have been active learners since the day they were born. They have learned through imitation and creative imagination; they have learned through play with parents and peers, and they have adapted to the behavioral norms of their immediate family and community. Most of these early learning experiences have been a natural part of their young lives: They learned to speak and to listen in their daily interactions with family members and friends, they played games, and they solved problems. Above all, they asked thousands of questions. Their curiosity is driving their learning.

The first day of school marks the day when teachers ask more questions than the children. The school curriculum provides the framework for teaching and learning rather than the children's natural curiosity about their environment. This is the time when knowledge as filtered through the school curriculum structures the child's learning experience. Control over learning is gradually taken away from the young students and shifted to teachers and schools. This shift can disrupt the natural flow of a child's learning process. Learning is not naturally meaningful and relevant to the child any more because it is not driven by her curiosity and interest. Learning may also not be connected to a child's experience any more because it does not come directly from their agenda and their view of the world. Adults now superimpose a view of the world, a structure that may be quite different from the child's experience.

The transition from child-directed to teacher-directed learning can result in the loss of the natural connection of a child's learning with their experience.

The transition from child-directed to teacher-directed learning can result in the loss of the natural connection of a child's learning with their experience. John Dewey (1974, 344) described this problem as follows:

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> Abandon the notion of subject-matter as something fixed and ready-made in itself, outside the child's experience; cease thinking of the child's experience as also something hard and fast; see it as something fluent, embryonic, vital; and we realize that the child and the curriculum are simply two limits which define a single process. Just as two points define a straight line, so the present standpoint of the child and the facts and truths of studies define instruction. It is continuous reconstruction, moving from the child's present experience out into that represented by the organized bodies of truth that we call studies.

When teachers feel that students have lost the connection with the school curriculum, they do their best to reconnect or, in Dewey's words, to reconnect studies and the student experience. Many examples in this book deal with this kind of connection, with relevance and meaning of learning.

The separation of subjects in the school curriculum reflects the thinking of previous generations but not that of the young learner.

Disconnection of teaching and learning often occurs through the separation of knowledge in school subjects. Formally structured learning is very different from the natural flow of learning in a young child's experience. To some extent, teaching and learning must expand the child's self-centered view of the world to include other perspectives. The child gradually learns about adult perspectives and accumulated knowledge. Through this process, which is normal and necessary, the young student becomes a member of the community. But, again, there is the risk that we may rush our students into this world before they are ready for it: They may not see the connections between the school subjects that the adults see. The separation of subjects in the school curriculum reflects the thinking of previous generations but not that of the young learner. Teachers are mindful of the difficult task of connecting areas of knowledge that must often seem disconnected to students.

One difficulty that may arise from the effort to teach and learn in context and to connect subject matter to the child's experience is the balance between learning separate skills and relating them to the whole within which they make sense. Children have to learn multiplication facts, spelling conventions, grammatical structures, and much more. They will learn these skills and facts with a larger purpose in mind: to solve mathematical problems or to communicate correctly in writing. The delicate balance between skills and facts and larger purpose may be lost if one of the two receives too much emphasis at the expense of the other. Children cannot learn successfully about mathematical processes if they don't know how to manipulate numbers. Some mathematical facts simply need to be at their fingertips. Perhaps the analogy with music fits: If a child wants to be a concert pianist, she still needs to practice scales on a regular basis. Practicing scales is not the purpose, but it may be the prerequisite for achieving the ambitious goal of performing great music.

Connections, as discussed here, always seek balance:

Connections seek balance.

- Teaching and learning must be connected through relevance to a student's experience.
- The separation of school subjects reflects the thinking of previous generations, not of the young learners. Connecting school subjects balances old structures with student experience.

☐ Skills, facts, and information are necessary ingredients of the learning process. Connected teaching balances the learning of skills and the larger purpose.

The larger community also has a decided interest in student learning that seeks connections. Business needs educated workers who see connections and adapt to changes in the work place readily. Society needs socially responsible citizens. Good citizenship and lifelong learning can best be promoted through connected learning experiences. Let us take a brief look at what kind of education experience we might design for a fictitious student. Let's call her Angela.

Angela's school

> Angela is currently an eighth grader in one of Wisconsin's middle schools. She will graduate five years from now. She cannot imagine what changes she will go through in her life as she prepares for her future. By high school graduation, she will have spent about fourteen thousand hours in school. This time will shape many of her attitudes toward learning and hopefully will prepare her for decision making in a society that is increasingly marked by interdependence, diversity, technology, and accelerated change. What educational experiences do we want her to have? What is our plan for Angela?

High expectations

> Many experiences will be similar to those of other generations. Much, however, will be different. As with past generations, we have high expectations for Angela. During the more than twenty-three hundred school days that she will be in a K–12 setting, we want her to be an active participant in challenging learning situations. If we place high expectations on Angela, we have to accept her right to place high expectations on her school and teachers.
>
> How will her learning environment be different?
>
> Angela grew up with computer and information technology. In fact, she is amazed that her teachers and parents did not have E-mail and the Internet when they were children. What appears novel to most of her teachers is highly familiar to her. Not only does she expect her school to be fully equipped with technology, but she also assumes that technology is integrated in all her school projects. Access to information and communication with experts as well as with other students around the world is not only a technological possibility but first and foremost an educational necessity. When Angela works on a school project, she has immediate access to information and expertise. Angela does not always look to her teachers to provide her with information. In a way, she does not expect them to know all the answers. But she does expect them to point her in the right direction and to put her in a position to find the information. Libraries are enriched by a communications technology environment. Angela must be literate in ways that preceding generations were not. The complexity of contemporary knowledge demands that.

Integration of technology

> Just as technology makes learning more individualized, faster-paced, and more interesting, connections across school disciplines

apply learning to real-life situations. An education that does not provide these links does not appeal to Angela. It may frustrate and alienate her. Life and knowledge are not segmented, and Angela's education should not be segmented either. Her school makes it possible for Angela to learn about these connections and experience learning as a meaningful and connected process.

Learning is meaningful and connected.

Angela's teachers realize that her school time must allow for reflection. Reflection is a necessary condition for creativity and constructive learning. Because time-pressured drills and repetition alone obscure connections and clarity of understanding, Angela's school will look at learning through the lens of connection and meaningfulness. This provides her with life competencies that are relevant to her as well as to her community. Her inquisitive approach to learning guarantees personal growth and added value to the larger community in which she will work after her graduation.

Angela's school also recognizes that students learn differently. Teachers make sure that each student has access to information and on-line courses. Angela is able to take selected classes in a virtual environment with students from all over the world.

> The technological innovations that have reformed business and finance in recent decades will both transform the organization of educational institutions and radically change what educators do as well as how they do it. The impact of these technologies on pedagogy is already becoming clear. As more professors develop on-line courses or components of courses, the traditional classroom inevitably changes. Most important, the classroom has expanded and now is global. Anyone anywhere in the world can, in principle, sit down around the same virtual table and learn together. What is studied in virtual global classrooms will be as different as how it is studied. Disciplinary boundaries are becoming as mobile and permeable as the screens on which courses are cast. Since the organizational structure of knowledge is always bound to the modes of production and reproduction in a particular society, technological changes issue in the reconstitution of knowledge. In the future, the curriculum will look more like a constantly morphing hypertext than a fixed linear sequence of prepackaged courses. When knowledge changes and both seminar tables and lecture halls become global, traditional classrooms will not remain the same.
>
> Mark C. Taylor (2001, 234)

Angela can choose from courses that integrate the visual and the verbal, the numeric and the scientific, the theoretical and the practical. She understands how she learns best and recognizes that emotion, diet, motivation, and her physical environment all are important in forming essential connections between the mind and the body.

Language, visual communication, and music are core elements in Angela's education.

Language, visual communication, and music are core elements in Angela's education. Her school does not force her to rely on verbal

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communication exclusively. This makes it possible for Angela to express her creative intelligence. She will increasingly take responsibility for making her own connections and for her own learning.

> Language is, without question, central to all learning. Every student, to be educationally successful, must learn to read with understanding, write with clarity, and speak and listen effectively. In the Basic School, language is defined broadly to include not just words, but also mathematics and the arts—three symbol systems that have their own unique characteristics and, at the same time, relate intimacy to each other.
>
> Ernest Boyer (1995, 65)

Angela's exit portfolio

Angela leaves high school with an exit portfolio. It contains an assortment of her best work in different formats that helps future employers or institutions of higher education make informed decisions about her placement. The portfolio is part of an assessment package that tells us and Angela how well she is doing. What Angela includes in the portfolio is decided in communication with her teachers, and its specifications make sure that it is a good representation of much of her work. This is work that can not be adequately captured in paper and pencil tests. It demonstrates Angela's ability to think critically and solve problems on her own. Combined with traditional assessments, the portfolio offers a lot of information about Angela's strengths and weaknesses.

Career counseling

Like most teenagers, Angela is not sure of a career path as she enters high school. Her integrated learning experiences put her in a position to assess what she wants to do after graduation. She fully expects to change jobs several times throughout her career, and she is prepared to do so because of the skills she acquired during her school years. Counseling is available to her through school staff and job centers but also through the advice of members of her community who are taking an increasing interest in her school and in her education.

In Angela's school, parents and members of the community are always in touch with teachers. They are ready to help, visit the school, and share their experience with the students, but they are also ready to comment when they feel that the school is not providing the kinds of opportunities that students need to succeed. Angela is a member of this community, and her success is based on the effort of many.

Citizen Angela

In return, Angela and her schoolmates are expected to be good citizens. Angela has learned to respect students of different ability, race, and ethnicity. Her ability to interact successfully with a diverse population is a major prerequisite for her success in her professional career as well as for the success of democracy in an open society. Likewise, Angela benefited from this open and respectful school climate. Only because she never has to worry about harassment or lack of respect can she succeed in her academic and professional endeavors. As a result, Angela can contribute to society in many different ways. She is both a contributor to and a beneficiary of a tolerant and respectful climate.

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Angela is expected to be proficient on a number of levels when she graduates. She is expected to be a good citizen and a diligent, accomplished worker—knowledgeable, skillful, and sensitive toward the needs of others. Her education is no small task for her school, her parents, and her community.

On Connections

3

This section establishes the need for connecting content and learner. Static views of learning are challenged by a discussion of connections ranging from Boyer's proposals for a thematic organization of the curriculum to a brief reflection on the unity of knowlege and learner. Several approaches to connecting the curriculum are described. Subsequent sections further elaborate on the issues discussed here.

Thematic Curriculum Organization

Addressing the national 1993 Association for Supervision and Curriculum Development (ASCD) Conference as president of the Carnegie Foundation, Ernest L. Boyer challenged his audience to abandon the Carnegie unit and think of education in much broader and comprehensive terms. "An educated person," he said, "is someone who is well informed, acts wisely and continues learning. But to be truly educated means going beyond the isolated facts, it means putting learning in larger context; and, above all, it means discovering the connectedness of things" (Boyer 1993, 2). The following summary of that speech is evidence of the dilemma of a great American educator caught between what he knows should be done and existing school structures.[1]

Boyer Declares Carnegie Unit Obsolete

In his opening remarks to the ASCD Conference, Boyer stated, "The time has come once and for all to bury the old Carnegie unit. . . . Since the foundation I head created this academic measurement a century ago I feel authorized this morning to officially declare the Carnegie Unit obsolete" (1993, 2).

Dr. Boyer went on to state that for too long education has been an "exercise in fragmentation, a pursuit of trivial pursuit. And for far too long, education has been based on seat time, not learning." He further cautioned that "the national assessment program should not be implemented until we are absolutely clear about what schools should be teaching as we enter Century 21" (2).

If the Carnegie Units are to be abandoned, then where does Dr. Boyer believe we should begin? He asserts that to be truly learned, we need to discover the connectedness of things, and he suggests eight thematic units that would help emphasize for students their common humanity:

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[1] This summary was provided by Mead R. Hanson.

1. The life cycle
    Birth, life and death
    Nutrition, health, and wellness
    A project that requires caring for some form of life
2. The use of symbols
    The miracle of words
    Reading, writing, speaking, and mathematics
    Ethics of communication
3. Response to the aesthetic
    The universal language of dance, music, and art
4. Time and space
    The study of different cultures—past and present
5. The social web of our existence
    The study of group life (family structures, institutions, governments, etc.) in different cultures
6. Production, consumption, and conservation
    The study of work in different societies
7. Our connectedness to nature
    The study of ecology, science, and technology
8. The search for a larger purpose
    The study of values and beliefs and the search for ethical, moral, and spiritual connections

Through this curriculum Dr. Boyer hopes that students will know that all members of the human family are inextricably connected. He believes that young people are ready to be inspired by a higher vision. He hopes students are measured not by a single test but by the quality of their lives, that we should work to build not only a better world but also a better climate for children.

Boyer's remarks in that speech and in other publications amplify a recurrent topic in the debate of the American curriculum: The fragmentation of the curriculum in an age of scientific and economic transformation.[2] Within this debate, the view that an educated person should know and learn more than isolated facts is not new, and neither are our attempts to organize formal education in a way that introduces them to the unity of knowledge. But we need to reintroduce that notion into the current debate to provide direction and purpose to school reform.

The term *connections* has been chosen carefully for this volume. Schools today are predominantly organized around a separate-disciplines curriculum despite a multitude of ideas regarding different approaches (Kliebard 1995; Cremin 1964). The Wisconsin Model Academic Standards (Wisconsin Department of Public Instruction 1998) define challenging content standards in each of the separate disciplines in the school curriculum. They frame "what students should know and be able to do," but they do not frame how teachers should teach. Making connections is part of the art and craft of teaching as well as of curriculum coordination. The Wisconsin Model Academic Standards make content connections visible at various points and therefore encourage connected learning and teaching.

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[2] *A Guide to Connected Curriculum and Action Research* (Wisconsin Department of Public Instruction 1997) gives an overview of how the curriculum can be organized around separate disciplines, projects, or student needs. Herbert Kliebard (1995) and Lawrence Cremin (1964) elaborate on the social, political and educational nature of the debate of what children should learn for which purpose.

The Wisconsin Model Academic Standards encourage connected learning and teaching.

Although we recognize that the organizational structure of our schools has changed little during the past century, we may now be at a historical juncture that accelerates change and necessitates radical departures from the status quo. All stakeholders, educators, legislators, parents, and the larger community will be looking at research in many fields of knowledge for how they might impact the way we approach schooling.

One of the questions that has been repeatedly asked but that still needs to be more clearly addressed in our schools today is how we learn from the work of researchers whose fields keep changing and who discover new connections all the time.

Many educators and philosophers have argued that substantial changes need to occur so that learning can be unified, more challenging and more in-depth as well as more meaningful and satisfying for the learner. John Dewey repeatedly argued in favor of a curriculum design that emphasizes the integration of separate disciplines within the larger context of education in a democracy. We need to understand, he writes, that the words *community* and *communication* are related (Dewey 1966, 4). Communities and societies exist in and through communication. And we have to keep building our communities through an astute awareness of how we communicate and how we relate to one another.

Communities and societies exist in and through communication.

Boyer, who served as the focus of the beginning of this chapter, proposes a "Basic School" (Boyer 1995) to bridge the separations that schools usually create. His remarks are important because he challenges the industrial model of school organization.

Scholars and scientists recognize that research results necessitate changes. Everything that we know about the world is a theory, but not in the sense that our findings are arbitrary. Theories are our best attempt at explaining the world around us. As research progresses, theories may change; as research progresses, questions might be posed differently. This progress should be reflected in the way in which we organize learning in our schools.

We can ask today if there are new ideas, ideas that may come from research in areas that thinkers such as John Dewey or Ernest Boyer could not have anticipated. What have we learned from new developments in technology, for example, that would help us create a vision of where we think education will be a few decades from now?

REFLECTION

What is your vision of education some twenty years from now? Which factors are most likely to trigger change?

Connecting Fields of Study

As humans, we use our senses and powers of reasoning to understand the universe. Interestingly, though, the more we learn about ourselves and the physical world, the more we become aware of our limitations. The more we know, the more questions we ask. Research in the humanities and the sciences is a process of verifying explanatory models. In our continual quest to learn and understand, we often realize that the boundaries of the disciplines that we have set up to study the universe are based on our knowledge at a given point in time. As our knowledge advances, new (and often hybrid) disciplines emerge. We find similar developments in the world of work: There were no typesetters before Gutenberg, and there are no typesetters any more due to the advent of electronic book composition. But we do have professionals who work on the layout of books, from the selection of fonts to an overall design. Likewise, there were no car mechanics before cars were invented and no rocket scientists before rockets. Sometimes new fields of study, such as biotechnology, emerge in ways that could not have been predicted. Consequently, jobs, careers, and professions are in constant flux.

How do students learn about these new fields of knowledge? Do schools have to introduce new subject areas every time a new research field establishes itself? Would Boyer's suggestions for thematic curriculum organization give us a broader umbrella under which students can discover and learn about these new fields in a more natural way than within the traditional school disciplines?

Most schools will respond to these questions by connecting the separate subject areas. Teachers will either bring knowledge from other disciplines into their classrooms, or two or more teachers will cooperate in an effort to connect the curriculum of their disciplines. Which solutions schools and teachers find depends a lot on how much common planning time is available for teachers and how broadly teachers define their own areas of expertise.

Consider, for example, an English Language Arts (ELA) class in which the novels of Charles Dickens are the subject of discussion. Students will soon find that they need to learn more about nineteenth-century England. They will have to understand what the rise of industrialism meant for working conditions, and they will have to understand some of the underpinnings of Victorian society. This type of learning is usually considered to be in the domain of historical research. Yet we do this frequently within the ELA classrooms.

Consider another example: Health educators are aware that our lifestyles are heavily influenced by the advertising efforts of major companies. Often, advertising campaigns target young students directly. Therefore, a good health education curriculum includes instruction in media literacy and reading as well as in economics and statistics. Students must know how they are targeted as consumers. Only then can they make good choices regarding healthy lifestyles.

Inquiry and research, teaching and learning often require the use of methods, concepts and strategies from several disciplines. As Erickson (1998) points out, such *interdisciplinary* (or *cross-disciplinary*) connections preserve the integrity of each discipline, because essential questions and concepts (see chapter 11 in this book) for each unit are discipline-based. The study of statistical representations of data in a unit on nutritional habits in a specific populations, for example, relies on an understanding of statistical methods and concepts and contributes to an understanding of larger questions in a health education unit. Erickson (1998: 77) also speaks of *intra-disciplinary* connections, when history, economics or geography are linked under the umbrella of social studies. Clearly, the more connections can be made within one classroom under the umbrella of one discipline, the more can be achieved without stretching or juggling school schedules.

Connecting Content and Learner

If a learner does not feel a connection to what he or she is asked to learn, motivation decreases and students are unable to make the kinds of content connections needed for understanding.

Most often the word *connections* is used in the context of linking separate content areas. Teachers know that they always have to connect content and learner, that is, linking content so that it makes sense and is meaningful to the learner. If a learner does not feel a connection to what he or she is asked to learn, motivation decreases and students are unable to make the kinds of content connections needed for understanding. This aspect of connections has traditionally been addressed in research on student motivation and different types of intelligences. Historically, child-centered and project-based curriculum designs have been proposed to meet the child's needs and interests first (see Kilpatrick 1926). Teachers would plan learning projects based on student interest.

Motivation is an important factor for successful learning. True motivation comes from the desire to learn and the ability for the student to see the connections to his or her own life. Teachers inspire their students with their own enthusiasm and interest in learning. Oftentimes students can become interested in learning by strong teachers who challenge them and set high expectations for performance. Students will learn better if they see a direct connection between what they learn and their lives. The following section addresses some of these issues.

Children and Learning

The Swiss psychologist Jean Piaget (Piaget and Inhelder 1969) laid the groundwork for understanding a child's mental growth. He demonstrated that a child's representation of the world differs from that of an adult. Therefore, teaching must recognize which conceptualizations and representations are adequate at each stage of a child's development. Learning and teaching, or in John Dewey's terminology, the child and the curriculum, must be connected by using representations that are appropriate for the student's stage of mental development.

More recently, Howard Gardner's research (1993a and 1993b) has received much attention from educators. Gardner suggests that all children have at least eight discrete intelligences and that each child has the potential to solve problems and learn in his or her own unique manner. Whereas Jean Piaget's work describes stages of mental growth for all children, Howard Gardner's theory of multiple intelligences is an effort to explain why children learn differently. Some children may be more visual in their learning than others; some may need a more analytical approach. Through a rich learning environment with multiple entry points, each student may have a better chance to engage in the learning process.

Neuroscientists such as Joseph LeDoux are exploring the emotional and behavioral side of learning. LeDoux (1998) has suggested that emotions drive attention, create meaning, and have their own memory pathways. Findings about the effects of emotions such as fear on learning supply a research base for structuring learning environments that reduce stress and anxiety for all learners through encouragement in a supportive classroom.

Eric Jensen (1995, 1997, 1998a, 1998b, 2000) has interpreted research about the human brain, applied it to teaching and learning, and reinforced it through his publications and workshops across the country (see also Wolfe 1996). His work is easily accessible for readers without much background in the methods and terminology of brain research, and it suggests that integrative, not fragmented, learning forms more meaningful and deep understandings. We also now know that the brain's learning process consists of five variables: neural history, context, acquisition, elaboration, and encoding (Jensen 1998a). All of this information provides powerful ways to alter the pedagogy of teaching and reassess how children learn.

Prior to coming to school, young children's lives are integrated—they discover, explore, analyze, create, and communicate their world in a joyful manner of play. Their heightened sense of wonderment and communication of their environment is one that continues to grow as they enter school. For some children, rich sensory experiences are part of their everyday lives; others are not as fortunate. Teachers give all children an opportunity to grow and expand, regardless of their experiences at home.

Knowledgeable teachers find different sources and forms of information to connect in the curriculum and document student progress through observing the learning styles and intelligences—to use Howard Gardner's terminology—of their students. They employ tools for learning that go far beyond the pencil, book, or busy paper work and provide a rich environment for learning. This environment provides children the opportunity for being active participants with the teacher in their own process of knowing by

- ☐ Establishing goals and criteria for learning
- ☐ Connecting ideas, identifying questions, and forming open-ended problems
- ☐ Solving these problems using critical and creative thinking skills in an open and supportive environment
- ☐ Developing perception—by researching and understanding historical and current ideas, images, and forms
- ☐ Including a variety of active learning processes (reading, writing, computing, reporting, acting, singing, constructing, designing, and moving), connecting one's senses with their intellect
- ☐ Valuing the process of learning, not just the end product of grade
- ☐ Using reflection as a skill for deeper understandings, including peer, teacher–student, and parent–student interviews
- ☐ Developing a matrix to assess their own learning based on criteria established for each learning project

Teaching and learning are complex and challenging. Most of what children learn comes to them indirectly, and the psychological state in which they learn determines their level of comprehension (Jensen 1998b). Students learn better in an environment that is threat-free and supportive, encouraging students to take risks and find fresh answers to problems. Children have a natural inclination to express themselves and will do so without fear of rejection or failure if allowed and encouraged to do so.

Children live in a complex world with an immense amount of information to absorb. They have to analyze, interpret, and understand a vast array of information. All too often, this information is presented in a fragmented manner, quite foreign to how children naturally learn. The integrative process connects and transforms ideas into new meanings. It helps each child use his or her unique intelligence and senses to create forms to understand their world whether it is through words, numbers, sounds, images, or movements.

REFLECTION

What can you do in your classroom to connect content and learner better?

☐ Name three strategies that you have used successfully.
☐ Describe three strategies that you plan to use more often in the future.

Concept-Based Connections

One of the standards movement's principal merits is the move toward larger conceptual units. No longer do we establish a long list of isolated skills or facts that students need to master. The study of history no longer focuses almost exclusively on the memorization of major battle dates. Similarly, foreign language teachers no longer emphasize only vocabulary and grammar. Teaching and learning in all subject areas is related to the learning of concepts and to greater understanding of the context in which it occurs.

Connecting content at the microscopic level of isolated facts and skills is hard because it misses the essential fabric of connections. Furthermore, it is often meaningless because it does not explain how events are connected. For example, studying the history of World War I by listing major events in chronological fashion is very different from studying the same war through the lens of developments in chemical research. The second approach adds a dimension of explanation to what happened and how that particular war resulted in different types of destruction. In addition, the discussion of chemical research and warfare links to current world events. Thus, a war that happened almost a century ago is brought into the present and into the lives of students. This deeper explanatory level is achieved through the connection of the separate school disciplines of history and science and is discussed at greater length in chapter 10, "Making Connections through Science, Technology, and Society."

Connecting content at the microscopic level of isolated facts and skills is hard because it misses the essential fabric of connections.

Learning goals are increasingly framed in terms of larger concepts, which is the intent of standards and assessment. It is necessarily also the major consideration in instruction. Teaching to concepts makes the task of connecting the curriculum much easier. H. Lynn Erickson (1998) discusses principles of concept-based curriculum and instruction. In this model, teaching and learning facts is clearly linked to conceptual ideas and generalizations within a theoretical framework. "The difference between a topic-centered and an idea-centered curriculum/instruction model," Erickson (50–51) writes, "is the difference between memorizing facts related to the American Revolution and developing and sharing ideas related to the concepts of freedom and independence as a result of studying the American Revolution." In Webster's *New World Dictionary concept, theme,* and *project* are defined as follows:

- *Concept:* An idea or thought, especially a generalized idea of a class of objects; abstract notion
- *Theme:* A topic or subject; a recurring, unifying subject or idea
- *Project:* A proposal of something to be done; a plan; a scheme; an organized undertaking

When teachers develop a connected curriculum, it is important to distinguish these basic terms. Entire schools may decide to have a unifying theme for a month, a semester, or longer. During this time students would be involved in projects related to that general theme. In Ernest Boyer's model, themes replaced the traditional school disciplines and provided a broader umbrella for connecting subject matter (also see Kovalik and Olsen 1997).

When students understand concepts their learning will make sense to them.

Concepts, on the other hand, are the mental constructs that are abstracted from mere factual information and help us organize observations in a scholarly manner. Only when students understand concepts will their learning make sense to them, and only then will we be able to talk about meaningful connections. A full discussion of this approach at the elementary level can be found in chapter 11, "Making Connections through Curriculum Design and Assessment for Meaningful Instruction."

Let us briefly look at the following two examples to see how concepts of time, survival, and space may provide exciting perspectives for student learning.

Immigration, migration, and emigration can be discussed in many different ways. Often, immigration to the United States is covered in history classes in the context of this country's formation. (Chapter 11 gives an example of learning about immigration to Wisconsin at the elementary level in the context of our ethnic heritage.) The conceptual lens of survival focuses on the reasons why people leave their country for another. Common reasons are poverty, the search for freedom, and escape from ethnic, political, and religious persecution. Student exploration of migration patterns across the world can look at the collapse of the Soviet Union and an understanding of the consequences of asylum law in many Western countries. The conceptual lens of space (or place) allows students to research where immigrants come from, where they go and how closely they live together with people from other ethnic groups in their new country.

Student research of migration typically looks at past and present, but students might also be asked to expand their research to extend to the future. What, for example, will the human race do to survive in the future if population growth makes food supplies scarcer? What will we do if our planet becomes uninhabitable because energy supplies have been exhausted? Or what will we do when we find ways to inhabit other parts of the universe simply because we have the transportation technologies to travel there? As we will see, the addition of the third element of future on the time axis allows learners to make connections across different disciplines that they might not have seen otherwise. It also allows them to expand the concept of space to a completely different place, namely, outer space.

The questions just listed are not at all far-fetched. Television shows such as *Star Trek* or movies such as *Star Wars* are examples of a recurring theme in popular culture that sets human drama against a backdrop of travel in outer space and survival on different planets. Their commercial success clearly demonstrates that they have captured the interest of young and old. The future of humanity on earth and other planets is also at the heart of ongoing scientific research in space exploration and technology.

Students are encouraged to think about space travel and community design on Mars in the Mars Millennium Project. This "official White House Millennium Council Youth Initiative challenges students across the nation to design a community yet to be imagined—for the planet Mars" (http://www.quest.Arc.nasa.gov/ltc/mars). A teacher's guide for school projects accompanies NASA's plans to establish a habitat on Mars in the year 2030 (http://www.mars2030.net). When teachers and students are asked to think about what a community on Mars may look like, they need to consider the impact of an environment completely different from Earth on the design of houses, the adaptation of art forms such as dance to much lower levels of gravity, the supply of food, or the emergence of new instruments and music. The Mars Millennium Project connects the arts and sciences by directing the students' attention to possible life on a different planet in the future. By asking themselves which aspects of their communities they might want to preserve and adapt for life in a different environment, they are also forced to think more clearly about what they value about the present. In doing so, their research follows NASA's mission: "to improve life here; to extend life to there; to find life beyond" (http://www.nasa.gov/bios/vision.html).

Connecting art and science

Although the Mars Millennium Project encourages cross-disciplinary connections, many of its research questions can be addressed in the social studies classroom within a teaching unit on immigration or community design. Students will learn that progress in the sciences has an impact on human life, and they will discover that life in a different environment as perhaps made possible by scientific advances presents us with very serious questions regarding community life. Their learning in the social studies classroom will be much more meaningful when past, present, *and* future are linked through the concept of time and through connections with disciplines such as the sciences and the arts.

The concept of time

Box City (http://www.cubekc/org), by Dean and Ginny Graves, is another example of a project that links the arts and the social studies through the design of communities. Whereas the Mars Millennium Project addresses the future and the design of communities on Mars, the Box City project encourages students to think about community design in the present. Both projects, however, aim at similar questions: What type of community do we want to live in? How can we design an ideal community? What decisions need to be made, and how can those decisions be made in a democratic fashion? Again, the concepts of place or space define some of the parameters within which such decisions can be made. A community design for the Arizona desert may be different from a community design for the mountains of Colorado. As described at the Web site, "The Box City Curriculum teaches how cities are planned, or unplanned; what makes a quality city, and how citizens (yes, kids too!) can participate in the improvement of the built environment. Occupancy permits, role playing name tags, building assignments—all are included and reproducible in this 160-page document. It is used by the Kansas City Missouri School District as a supplementary text, is a workshop inclusion for the San Antonio Conversation Society, and a regular feature for 1500 kids in Dallas at arts festivals."

Box City is a very popular project at the elementary level in which students are asked to design a city by using cardboard and other materials. They have to arrive at decisions about the use of space in their new community. This leads to many questions regarding local government. The project has very strong content implications: Topics from the social studies, the visual arts, elementary mathematics (in designing buildings and streets, for example), or environmental studies will have to be addressed. If the project is conducted as an art activity, students will concentrate more on the creation of a cardboard model of a city than on the many choices and solutions that real city planners have to deal with. How can we add to the complexity and depth of learning?

The concept of space

One addition would be to look at the decision-making process through the lens of use of space. How does available space impact city design? Do we want to protect some space and not build on it? How does the geography of an area play a role: Are there rivers, lakes, mountains, or forests? How do we use that space? And how do we build around it?

All of these questions can be addressed at different grade levels at different degrees of complexity. Imagine tweaking the Box City project through an international component. Usually, students in a classroom have only the American experience of space, which, with the exception of some of the larger metropolitan areas, means large open spaces. Urban sprawl is a consequence of the ability to expand communities into undeveloped land. Consider working with a partner school in another country. Europeans have a very different experience of space because population density there is far greater. How does availability of space impact the design of a city? What other considerations, such as use of mass transportation, either follow or precede urban sprawl? Where are shopping malls located, where are the schools, and where are the restaurants? Working with students in other countries on projects such as Box Cities, using software such as SIMCITY or simply by exchanging photos, videos, and e-mails could provide tremendous learning experiences.

Projects such as Box City can be conducted solely in the arts classroom. Wonderful models can be designed, and students will be engaged in the learning process. By adding other perspectives and lenses such as use of space, students will gain a deeper understanding of the design of cities. Other concepts such as community, choice, or involvement will further enhance the learning experience.

REFLECTION

- Give some examples of intradisciplinary connections in your content area.
- Give some examples of concepts in your content area. Can you organize your curriculum around those concepts? How will that affect student learning?
- What opportunities do you have to plan curriculum with colleagues in other grades or subject areas?

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Making Connections: An Interdisciplinary Approach

4

by Catherine Porter Small

This personal essay proposes the integration of literature and social studies and was first published as an introduction to a textbook. The author speaks from her own successful experience with teaching integrated units.

The Interdisciplinary Inoculation for Teachers

> "The Winslow Homer film is in my room for the week. Sign up if you want it. Can we all go to West Bend together for that exhibit before it leaves?"
>
> —*Rick (English)*

> "Let's rename that course Gender in Literature, History, and Art. It reflects the curriculum of that elective more accurately."
>
> —*Julie (History and English)*

> "The symphony's fall performance for students is about the American Dream. There's even a selection from that opera about Malcolm X. Shall we do a field trip?"
>
> —*Lon (English)*

> "When do you want me to do the architecture slide lecture for your students? Next week will work for me."
>
> —*Kathy (History)*

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> "Public television is running a special on American jazz this week. I'll tape it for our teamed class if you want."
>
> —*John (History)*

> "Has anyone got a tape on the Salem witch trials I can use? It's *Crucible* time again."
>
> —*Jan (English)*

> "Aren't you going to the NCSS? Please look in on the session on making connections between history and science. I've got a live one interested in the science department."
>
> —*Dennis (History)*

Burn-out is a professional disease among teachers. Stressed out and overworked, veterans of the school wars are susceptible to digging in, doing it the old way, and preserving energy. After years of the paper burden, it may be that English teachers are most susceptible to the dreaded disease, with history teachers close behind. Yet the memos above are just a sampling of those I received from colleagues during the first quarter this year. One teacher has taught sixteen years and the rest between twenty and thirty. I teach American history and American literature and taught my first classes in 1974, but I'm still fired up and so are they. We've received the interdisciplinary inoculation against burnout. Our intellectual health has improved along with our students'.

However, when we began interdisciplinary courses at the freshman and junior levels seven years ago, not all of these teachers initially embraced it with equal fervor:

> "Is this just one more swing in the educational pendulum?"

> "Will I lose coverage in a course that already contains too much material and too few days?"

> "I don't know enough to teach this way! What do I know about the other disciplines?"

To make the connections necessary to establish a new curriculum of this kind, we had to begin to rely on the expertise of others in our school and community. History teachers wrote simple time lines of major events to jog the memory of the English teachers. English teachers reviewed the plots of novels read long ago by the history teachers. We all invited each other to classes. Regular meetings revolved around ways to make linkages, sharing discoveries. We threw lesson plans and hand-outs in each others' mailboxes. Nobody minded much the extra time they were taking because they saw the possibilities of teaching in an expanded way from a wider understanding with a safety net of their fellows. Ultimately, we saved time as we worked with one another, and collegiality replaced the lonely, closed classroom.

The unexpected benefit of establishing, developing, and maintaining interdisciplinary connections has been the professional growth of the faculty. We've attended workshops, institutes, concerts, and art exhibitions together, and we call upon one another's expertise on a regular basis.

Cooperative learning takes place at the faculty level. I suspect the interdisciplinary approach has been the inoculation that has prevented that dreaded burn-out that assaults too many veteran teachers. I've seen colleagues who were tired get reinspired, including myself. Perhaps it's not the inoculation as much as the mental exercise that produces the teaching fitness.

The interdisciplinary approach has been the inoculation that has prevented that dreaded burn-out that assaults too many veteran teachers.

The Advantages for Students

I ran into Tanya at a restaurant a few years ago. She was in my history class before we used an interdisciplinary approach. She said, "I'm embarrassed that I only got a D in your class. But you'll be glad to know that I took History of American Art last year. I learned so much! Now I get it. I even read historical novels all the time." I should have offered the apology. She was a visual learner, and I was a print teacher. She brought interest and capability to class that I had not tapped. Now, she would use the images of Paul Revere and Jacob Lawrence and George Caleb Bingham as text too. Now she would read *Black Boy* while studying the Great Migration. Now she would "get it."

The advantages for the students are clear. Interdisciplinary study provides a context for learning, a background for the figures of literature. When we learn anything in context, comprehension improves. When comprehension improves, interest increases. When interest increases and learning occurs in context, students retain what they learn better than they do when they learn subjects in isolation. Each of us has had the experience of making connections sloppily, and sadly too late. If only we'd taken that American history class at the same time we'd taken the American literature course, the literature would have made sense. If only we'd taken Western Civilization while taking Art Appreciation, or perhaps Philosophy, we would have understood.

Marshall McLuhan, the media guru of the sixties, warned us that we would be teaching a new breed of young people not as enamored with print media as their parents because they learned in an electronic environment of television, radio, and movies. They would be visual and aural learners in print-dominant schools. Our first attempt to meet this challenge was to expand technology and resources: audiotapes and videotapes flooded the classrooms. Newer technologies have followed, especially those linked to computers. What we frequently missed, however, was that the way we learn outside the classroom has less to do with technology and more to do with the way the world works: Separating the disciplines is in itself artificial. Writers don't write isolated from their culture. They are informed by the intellectual ferment of their history and times. All literature has time and setting. Poets respond to their times. History is written from perspectives shaped by the artistic response to events. Visual artists create works of art that have symbolic content, real or imaginary, in styles shaped by the milieu of the American experience. To study these subjects separately is as limiting to students as study-

Separating the disciplines is in itself artificial. Writers don't write isolated from their culture.

ing from the printed page alone. Providing linkage provides real insight. And insight leads to wisdom.

In a meaningful way, an interdisciplinary approach can put to a consistent use the educational buzzwords and concepts that keep re-emerging: cultural literacy, upper-level thinking skills, writing across the curriculum, multiple intelligences, authentic assessment, cooperative learning, and so on. These are the natural tools of such a curriculum. The insights students gain are audible: "Aha! Now I get it."

Guidelines for Developing a Program

The following guidelines may assist you in starting or expanding a program:

1. If you make it a goal to look for connections, you will find them, either thematically or chronologically, or, best of all, both.
2. If your state has a humanities council, apply for a grant for workshop time.
3. Your goal is to give the students entry-level knowledge in disciplines that do not fall under the course headings. You don't have to be an expert.
4. Discover the strengths of your faculty. Much of what you want to include in your curriculum can be taught to you or your students by other teachers with expertise developed either inside or outside classrooms.
5. Document your linkages so they can be duplicated by other teachers or even next year.
6. Challenge the students to look for and articulate connections. Popular music lyrics sometimes contain strong references to arts and letters.
7. Teach new, test new. If you take twenty minutes to allow students to "read" Winslow Homer's painting, "Prisoners at the Front," while studying the Civil War, questions about it had better appear on the next test.
8. Use your textbooks in new ways. Help students discover the assumptions their text was based on. Use the illustrations for developing context. Have the students look for connections in their other texts.

A Final Word

Thirty years ago, I entered college as an English major and met the New Criticism. As I understood it, each work should stand alone and be judged on its own merits. The author's life, the times he (of course) lived in, the "conversation" he was having with other artists who used other media of expression were to be ignored. How sterile. How threadbare. What unfortunate training for so many of us. For the future English majors in our classes, that old New Criticism might work. For the rest, and especially for the Tanyas in our classes, they deserve as rich a fabric as we can weave.

Best Practice Profile

Mt. Everest Project

Title: Climbing Mt. Everest
Source: Barb Wentworth, Kettle Moraine Public Schools
Related State Standards

Physical Education:
A.8.1 Establish personal physical activity goals.
Environmental Education:
A.8.1 Identify environmental questions that can be investigated using available resources.
Health:
G.8.3 Demonstrate the ability to work cooperatively advocating for healthy lifestyles.
Mathematics:
E.8.1 Work with data in the context of real-world situations.

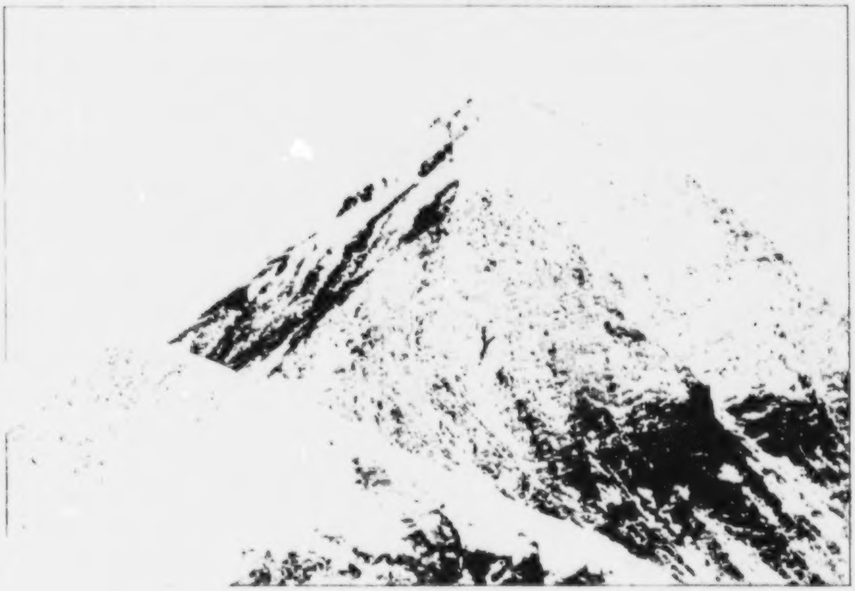
Concepts
Success, Determination, Cooperation, Challenge

Connecting Elements
- Provide a context
- Establish personal relevance
- Connect learning to real life
- Connect different subject areas

For the past decade, Barbara Wentworth, physical education teacher at Magee Elementary School in the Kettle Moraine School District, has lived a philosophy of an active lifestyle. As an educator and role model, she has involved students, staff, parents, and the community in personalized fitness activities within a global context. During the 1998–99 school year, Magee's students "climbed" Mt. Everest in theory by converting fitness miles to feet on the mountain. At the end of the school year, an amazing 25,255 miles had been posted. In theory, they had made it to the summit and returned safely to Base Camp.

In the next school year, that simulation became a reality when Barbara Wentworth trekked to Mt. Everest Base Camp. Her students partnered in that expedition via the Internet. In the process, technology was used to learn about past and current climbs. Fourth and fifth grade students had a chance to interview David Breashears, IMAX movie director of *Everest, Mountain without Mercy,* and then created newspaper articles using downloaded pictures taken during the interview on the school's digital camera. A heart rate monitor that Barbara wore on the climb helped students learn how the cardiovascular system was affected by altitude and how her pretrek training helped her succeed. Associated interdisciplinary lessons also focused on writing, the study of tectonics, temperature and wind chill, nutrition, and Himalayan art and culture. The environmental impact of mountain climbing on the Himalayan region was examined along with high-altitude health issues.

Barbara Wentworth's philosophy of learning is capsulated in the catch phrase, "Do something you never thought you could do!" Traveling to Nepal and trekking to Base Camp fulfilled her vision quest. She comments on how she taught her students about challenge and fortitude while reinforcing a personal desire to reach a seemingly impossible goal as follows:



I believe that teaching is more than just an occupation. It is a gift for a teacher to guide young people throughout their educational process. In physical education, the mere frenzy of activity lends itself to an outward display of love for life and movement. This is the message I have encouraged my students to understand and take with them as they complete each year's journey to a new fitness destination.

The school/community fitness destinations motivate children, parents, staff, and community to achieve healthy, active lifestyles as they contribute to one common goal: They convert completed fitness miles into destination miles. This learning partnership begins in school and flows to the families and community to improve fitness and to bond the family. My professional satisfaction has been to see the joyous faces of over three hundred children and their parents, teachers, and support staff at the end of the school year as I announce the total miles contributed, the success of the journey, and the destination selected for the next school year. The fact that Magee Elementary has completed each goal for the past nine years speaks for the success of the program, and that meets national standards for physical education—contributing to a healthy, active lifestyle.

Personally and professionally, I have gained more than ever believed possible from the Everest expedition. Besides the physical accomplishment of completing the Everest Base Camp Trek, my skills in marketing, curriculum development, professional speaking, cultural experiences and connections, and technology education soared. I also felt more confident about my message to students about the importance of setting goals, working together in a team, putting in a great effort, and communicating efficiently as well as subjecting myself to a strenuous physical training program.

The Mt. Everest '99 Project proved to involve children not only in my school but also in other schools in Kettle Moraine, the state of Wisconsin, and the country via the Internet. The involvement was not only in the physical education classroom setting. It bridged into academic areas of math, science, reading, writing, culture, geography, technology, art, and music. Family members and friends of trek participants from France, South Africa, Switzerland, and the United States were able to track our progress on the Internet and shared the experience at their schools.

The Mt. Everest Project began as the eighth annual "fitness destination" goal for my students. My personal trek toward Mt. Everest Base Camp in November 1999 extended that curriculum integration project (http://www.kmsd.edu/everest.htm). Through the work with teachers, students, and parents of Magee Elementary School as well as the entire school community of the Mt. Everest Project, I experienced firsthand the impact of curriculum integration. Amazing learning and powerful relationships occur, when classroom teachers and school specialists work together to create a connection of ideas and concepts. Students become engaged in more active learning and assume greater responsibility for their own learning. Collaborative efforts among the entire school community are difficult to achieve, but this model allowed teachers, students, parents, and the local community to work as a team in a collective effort to achieve a goal.

Developments in brain research verify the degree to which neural connectors are expanded when learning allows students to see and make connections, when it takes place within a meaningful context, and when it is connected to ideas and concepts across other content areas. Research-based instruction creates an environment for active and engaged learning. When what students learn is able to penetrate the classroom walls, it stimulates them to question, experiment, collaborate, test, and explore information so as to create new meanings of patterns. In this way, the framework provided for students to experience successful and productive lives is established. Today, teaching professionals are driven to examine their curriculums and strengthen their repertoire of teaching strategies based on these findings. The need is present for teachers to envision how integrated learning enhances the development of the whole child while meeting measurable state standards. The Wisconsin Academic and Performance Standards promote both the learning of the subject content and the extension of that learning across the curriculum in areas such as the ability to think, skill in communication, production of quality work, and connection with the community. This is what gave further inspiration to extend the Everest Project globally.

School reform addresses the notion that real change occurs at the point of contact, where instructional techniques meet student learning. Through the Mt. Everest Project, I have seen the positive and permanent effects of an integrated learning model. Most importantly, teachers and students have been inspired through this process to develop ideas and concepts within a broader context so as to effect rich and purposeful learning through an engaging and integrated curriculum.

Making Meaning: What Is It All About?

5

Eight principles for connected learning provide the basis for many practical classroom suggestions. The main emphasis lies on the importance of connecting information and knowledge with personal experience and real-world applications for better student performance. Readers are invited to reflect on their own practices and to add to the list of learning strategies in this chapter.

The standards define what students should know and be able to do. Implicitly, they give us permission to design curriculum and instruction in accordance with what we know today about the human brain and learning. Students must be able to solve problems and find answers. Teachers have to strike a balance between helping students discover innovative solutions to problems and providing answers. As discussed in previous chapters, much of what we know today about the brain and intelligence appears to confirm what John Dewey and John Kilpatrick suggested at the beginning of the last century. Kilpatrick's insistence on student problem solving and Dewey's comments on teacher guidance add a historical dimension.

> "The important thing in education is to insure that the purposes and plans are those of the learners, not the teachers," writes Kilpatrick (1925). "Don't you think that the teacher should often supply the plan?" Kilpatrick is asked by a critic. "Take a boy planting corn, for example; think of the waste of land and fertilizer and effort. Science has worked out better plans than a boy can make." Kilpatrick answers, "I think it depends on what you seek. If you wish corn, give the boy the plan. But if you wish boy rather than corn, that is, if you wish to educate the boy to think and plan for himself, then let him make his own plan."
>
> ***(Cremin 1964, 218)***

John Dewey agreed with this basic assumption but added that the child needed direction.

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[1] Mike McKinnon originally included this piece in his publication *Common Ground: Practical Ideas to Promote Interdisciplinary Cooperation between Social Studies and Second Language Instructors* (New York/Janesville, WI: 1992).

> For the child simply to desire to cook an egg, and accordingly drop it in water for three minutes, and take it out when he is told, is not educative. But for the child to realize its own impulse by recognizing the facts, materials and conditions involved, and then to regulate his impulse through that recognition, is educative. This is the difference, upon which I wish to insist, between exciting or indulging an interest and realizing it through its direction.
>
> *(Dewey 1899, 57)*

This direction, Dewey argued, has to come from the school and from the teacher. This is what transforms an impulse into learning and education. Neither allowing the student to experiment endlessly on her own nor supplying the plan for the student to follow should be the exclusive goal. Seeking a balance between the two approaches ensures an optimal education experience.

The eight strategies and examples presented in this chapter all follow one principle: Teachers set up the context in which students construct meaning. Each student constantly seeks to make sense out of what is happening because the brain is preconditioned to make meaning. But bear in mind that each student as well as each teacher has different life experiences. Therefore, different contexts are found and different connections are made. Time, a certain comfort level, and support are needed to do that. If they don't have that, learning will be temporary at best.

With the following eight strategies, teachers provide direction. But they do not provide the plan.

- ☐ Establish a context
- ☐ Seek to establish personal relevance
- ☐ Make emotional connections
- ☐ Relate learning to the real world
- ☐ Establish patterns
- ☐ Think of the big picture
- ☐ Allow for processing time
- ☐ Promote in-depth interdisciplinary inquiry

Establish a Context

Information needs reference points.

Isolated, segmented instruction is not conducive to long-term memory acquisition. Instructional focus must be put within a framework that gives information a reference point. Only then can information be transformed into knowledge. The students should be able to understand the relationship of the learning to themselves and the world around them. Lessons must be placed within parameters that ground learning in time, place, and purpose.

Applications

1. Geography teacher Frank Douglas received much deserved recognition for turning his classroom into a living, breathing replica of the region under investigation. When he taught about cultural customs of Asia, he

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turned the room into a Japanese teahouse with the help of his students. Waterfalls and wild animals graced a rainforest in Costa Rica, while an active volcano awaited students in their investigation of the South Pacific.

2. Tom Burgraff is an elementary art teacher who truly dresses the part. For a week he became Rembrandt, Monet, Pollock, and Van Gogh. Costumed and made up to look like his namesake, students call him by his assumed name as he teaches them the techniques employed by the great masters.
3. After introducing a new unit, give students a chance to pair up and discuss its purpose and the direction they feel this learning will take them. This unstructured dialogue gives students a chance to frame the learning or establish the context for learning.
4. To understand the setting for the diaries of Anne Frank, a group of students chooses to spend a day in a crowded cellar or attic to recognize the physical and emotional effect such a life had on Anne. Individual reflections and sensory impressions are recorded in their own "diary entries."

Seek to Establish Personal Relevance

Students respond positively to problem-solving tasks to which they can relate. This does *not* mean that students must have been in precisely the same situation before; rather, it is important to stretch their prior experiences and apply them to new situations. Be specific about why particular information or skills are important for the present and for their future.

Students respond positively to problem-solving tasks to which they can relate.

Applications

1. Ask each student to decide how they would spend $1,000,000.
   Within five minutes, they must put the items they would buy (at least five) in rank order. Once the exercise is completed, have them identify five adjectives or nouns that describe the motivation for their acquisition of specific items. Break into discussion cycles and have each student share their list and rationale. After the last pupil has finished speaking, have each of them review their original allocations and make modifications based on peer input. Which two adjectives or nouns now best account for priorities in this decision making? Do they think these priorities will change in 20 or 50 years?
2. Many Wisconsin middle schools develop student yellow pages. In this project, each class member identifies an area of strength, personal interest, or hobby. The information is compiled along with student-generated artwork to convey the multiple talents within a unit or house. Each student is given a copy of the yellow pages so they can call on other classmates for assistance both in and outside the school building. This contributes to an understanding of how teamwork can outperform the efforts of individuals.
3. Student goal setting establishes personal relevance in a class, studio, performance center, or gym. On a weekly basis, students identify short-term

goals that are both challenging and doable. They should also establish the evaluation method to determine how well they did in reaching this desired outcome. Long-term goals are also appropriate. One health class emphasizing physical exercise had several students commit to running a half marathon at the end of the semester. Not surprisingly, they all did it!

4. Students are asked to find out what the safest sources are for drinking water in their home or community. They have learned that humans should drink at least two liters of water daily and that the most common sources of drinking water include
    a. A household tap
    b. Home-filtered systems
    c. Commercially bottled water

    Students are then asked to rank order the three sources of drinking water from safest to least safe, from a microbiological or ecological standpoint. They are instructed to give reasons for their rankings using complete sentences or to write and design a flyer for households that inform home occupants of the safest source of drinking water.
5. David Wentworth, a high school chemistry teacher, offers a successful integrated activity that reveals the true cost of smoking. This lab exercise, which could be carried out in most science laboratory facilities, involves burning a cigarette in the lab apparatus and using suction to capture both the primary and secondary smoke. The tar will be very evident both visually and by odor. To avoid a strong smoke odor in the room after the lab, the apparatus should be carried to an exhaust hood prior to retrieving the tar-laden filter paper. After the lab, economics is integrated by calculating the future value of the money spent on smoking. The calculation can be done by either spreadsheet or calculator. For the economic calculations, the assumptions are that cigarettes today cost $3.00 per pack and that the cost will increase 5 percent per year for 40 years, with one pack per day being smoked. The money saved by not smoking could be invested at 12 percent per year, a reasonable investment assumption for most stock mutual funds with at least a 40-year history. The end result is that the future value of the steadily increasing cost of smoking for a 40-year period is a little over 1.5 million dollars.

Make Emotional Connections

Emotions influence the learning process.

We referred earlier to Joseph LeDoux's (1998) work on the relationship between emotions and the brain as well as Eric Jensen's applications to teaching and learning. Both authors suggest that emotions influence the learning process in at least two ways:

1. A positive classroom climate minimizes fear and stress. Students learn better in an encouraging and positive atmosphere.
2. In some cases, emotions provide better access to content. When students are asked to understand and debate issues in the humanities, empathy may help them to see issues from different perspectives.

The following examples illustrate both approaches. Note that they are only the starting points in a learning sequence: A positive classroom helps students to express feelings when asked to empathize with others. This is often a necessary but not sufficient condition for learning.

Applications

1. Judy Carlson's third grade students investigated the plight of children in war-torn regions of the world. They looked at photographs of these desperate young people, many of them the same age as they were. They also saw pictures that those children had drawn to project their feelings of fear, insecurity and loss. These photographs and pictures communicated a much more direct and emotional message than a reading passage could have. The third-graders then brought drawings or symbolic representations that offered love, support, and caring and placed them next to the picture of a child.
2. A teacher in western Wisconsin wants his students to start off each day in a positive emotional state. At the beginning of each class period, he sets a few minutes aside for a discussion of issues that were on his students' minds. This also allows him to connect emotionally with his students before formal instruction begins.
3. Storytelling, role-playing, and personal commentary are powerful tools in evoking feeling.
    - Share poignant stories with your class.
    - Dress as a World War I combat soldier and with a background of sound effects and movie soundtracks describe the horror of trench warfare.
    - Debates on ethical issues such as capital punishment, school mascots, and sports hunting can stimulate intense emotional arguments; students then learn to move on to rational, in-depth analysis and evaluation.
4. Drama and role-playing are highly effective strategies to promote meaning and emotional linkages. Place in the classroom a large trunk that is filled with props, especially puppets, and encourage students to involve themselves in activities that have them communicate through a third person; they experience a perspective other than their own.
5. A south-central Wisconsin teacher uses music as a way to influence the "emotional rhythm" of his class. Various pieces are used to introduce different activities, and students soon respond positively to these musical clues.

Relate Learning to the Real World

Learning must not be confined to the "two by four" of traditional teaching. The two covers of a book and the four walls of a classroom cannot continue as the beginning and end of a learning cycle, and neither should they define the

Meaning is predicated on the ability to transfer and apply what is learned into a new meaningful context.

boundaries of learning. Educators must link school to community and community to world. Through technology, expanding to the world becomes an everyday possibility. Furthermore, students live in their own world, which must be welcomed in schools. Meaning is predicated on the ability to transfer and apply what is learned into a new meaningful context. That extension can be across the street, in a neighboring state, or many time zones away. That path, it must be emphasized, moves in two directions. Schools must reach out but also invite in.

Applications

1. Rod Montanye's ninth grade students use mathematical concepts and applications in problem solving with local businesses. During the summer, he meets with project engineers and production specialists to identify a series of situational problems that form the basis of student data collection and analysis. The nine-week unit culminates with local managers critiquing the merits of action plans developed by students that address actual situations.
2. Jane Thompson brings the world to upper-level Spanish students by connecting them with sister classrooms in Argentina. Using the Internet and videoconferencing, the students exchange commentary on topics of mutual interest in the target language. To cement the relationship, exchange visits have taken place between teachers from both countries. Seeing your Spanish or English language teacher on the other end of a technological link that is thousands of miles away is a powerful experience.
3. Intergenerational Day is an event in which retired members of the community are invited into the school to set up learning stations on a variety of themes that cut across time and place. A sampling of these modules might include demonstrations of folk crafts, barbershop quartet singing, woodworking, oral history storytelling, and artifact displays. Students move from station to station, taking part in related activities that are designed to give them an enhanced perspective in continuity and change.
4. This activity centers around soliciting and displaying student opinion on a variety of contemporary topics. Commentary is requested in world and English language classrooms on an array of interesting, age-appropriate questions. Written responses that have been edited and "fine-tuned" are then displayed on bulletin boards in school hallways. These message centers are colorful and upbeat. At the top of each display the inquiry question is prominently displayed, and separate panels are available for individual comments. Included in the display is a photograph of the respondent with the student's name and grade level, and reproduced underneath is the student's response written in the first or second language.
5. The local newspaper can be a tremendous resource in bringing the community into the classroom. One way is to develop mathematical assignments through the community setting. Rather than using examples from a textbook, find data in the local newspaper. For example:

Yesterday the babies born at local hospital had the following birth weights:

7.6 lbs. 8.4 lbs. 7.3 lbs. 6.5 lbs. 8.9 lbs. 9.3 lbs.

Ashley was born today and weighed in at 7.4 lbs. Explain how her weight compares with the average weight of the babies born yesterday.

6. Steve Pease developed a week-long set of activities involving accuracy in basic skills and its connection to the world. Activities include the following:
   - Reading technical directions for assembling furniture as well as making and selling the products.
   - Inviting police officers as guest speakers to talk about the importance of accuracy in writing police reports. This included staging a mock crime and students filling out a replica of the local police report form. (The kickoff activity was the staged "arrest" of a teacher—handcuffs and all—in an assembly.)
   - Creating the need to understand written directions by inviting a district manager from Ameritech Cellular who discussed the need for accuracy in programming cell phones. Students then received a copy of technical directions and programmed a phone. If done accurately, they were allowed to make a call; if the work was less than perfect, the phone was inoperable.
   - Establishing panel discussions with community members regarding the application of school skills in a variety of workplace settings.
   - Manipulating fractions and operations in altering recipes, students were required to eat the results of their work.

Establish Patterns

The brain seeks patterns. In searching to make meaning from new stimuli, our brains continually attempt to make connections and associations that fit patterns with which we are familiar. Our brains are pattern seekers, which is one reason why it is so difficult to remember isolated or disconnected data. Even if a task is meaningless, the brain will attempt to establish meaningful associations. If students are given the opportunity to discover and organize content, new patterns emerge. Not only will students remember better, but they will also recall information more quickly.

The brain seeks patterns.

Applications

1. Exploring with wooden, plastic, or cloth blocks helps children recognize and create visual patterns. Make or purchase colored blocks of varying sizes, one inch or less. Same-shaped blocks (trapezoid, hexagon, square, triangle, and diamond) should be painted the same color and be similar in size. Using these blocks will help children identify geometric shapes and their particular properties. They will also be able to use geometric shapes to make other shapes as well as showing and naming fractions while ma-

nipulating blocks into halves, thirds, and fourths. Another idea is to have students cover a block using other blocks. For example, ask students to cover a hexagon by using two other shapes.

2. Music and its rhythm can have a meaningful role in teaching students about anticipated or recognizable patterns. Play an instrumental selection and have the students clap with the beat. At a predetermined point, stop the music but have the students continue their clapping for 15 seconds. Ask them to explain why they clapped the way they did. How was it the same or different from other students' clapping? Rewind and restart the music and have students determine the appropriateness of their response.
3. Working with older students or adults, put the following capitalized sequence of letters on a blackboard or flip chart: F, S, T, F, F, S. Ask the group to identify the next letter. Most will call out the correct letter, S. Now ask for the next letter. The collective response will be T. That is wrong. The correct answer is E. It is followed by N, T, E, T, T, F, F. At this point, the group consensus will positively identify the correct answer, S, followed by another S. These answers will vary. Some will suggest a third S; others, two Ns or Es followed by three Ns or Es. They are incorrect. The next letter added to F, S, T, F, F, S, S, E, N, T, E, T, T, F, F, S, S is E followed by an N. Usually at this point somebody has caught on and will supply the rest of the letters: T, T, T, T, T, T, T, T, T, T, T. Still, some will not understand what comes next. Without exception, they will assert that they are looking for some deeper pattern or repetition in the imagined sequence. The brain by nature seeks patterns even if one does not exist. In this case the capital letters were in no particular sequence at all but the first letters of *first, second, third, fourth, fifth, sixth, seventh, eighth, ninth, tenth, eleventh,* and so on.
4. Students can learn to find linguistic and semantic patterns simply by identifying parts of words and explaining their meanings. What separate parts of the following words, for example, can be identified? And what meaning do the separate parts of the words carry?

   disconnect disprove disagree dislodge approve disapprove
5. A Milton educator observes:

   "Silent review" has been the most successful method for closure to social studies units. All "answers" for the test are written on construction paper rectangles. They are organized in a mind map or graphic organizer on the blackboard using magnets, colored chalk, and a concept that connects all the answers. In addition, chalk caricatures of famous people with cartoon word bubbles containing a defining statement might be included.

   All answers are organized with their overriding concept, removed from the board, and placed on the floor before students arrive. Students *silently* leave their seat and place the 30 or 40 answers in the correct space on the graphic organizer, *thinking about patterns* and justification for the location they select. After the first completion, students are asked to explain the placement of concepts.

   It is amazing to watch an entire class silently walk to the board and place answers in patterns based on concepts and then discuss why. The organizer, without the answers, is left on the board the following day for the test. Classes can be timed to see how quickly they can complete the patterns on the board after the first time.

This activity accesses semantic (encyclopedic, list oriented), episodic (contextual and experiential), *and* procedural memory. The process of looking for patterns and connections is as valuable as learning factual information.

Think of the Big Picture

Students need to see the big picture.

Teachers frequently scatter a jigsaw puzzle on a back table in the classroom. When asked why, they will explain that they want their students to see how things fit together. It is important that the learner see the relationship of the individual piece to the visual whole. Students need to see the big picture in sorting out random bits of information to form frameworks to make meaning.

Applications

1. A science teacher in the Fox Valley highlights coming attractions by having students develop movie posters that foreshadow learning. These colorful, upbeat posters briefly describe the story line of such movies or units as the Bunsen Burner Kid and "Romancing the Stone: Wisconsin's Love Affair with Slate." She also has her pupils make short, focused, one-minute sneak previews that appear on television screens prior to instructional videos. In both cases, the projects are developed as part of a review process for unit evaluations emphasizing broad themes and concepts and are shared with students the following year.
2. First grade teacher Deb Somerville has a highly meaningful way to teach the concept of extinction to young learners. As part of a rainforest lesson, she divides her class of 22 into groups of 7, 5, 4, 3, and 2 while 1 student works independently. Each child in a group is given butterfly wings that they must color the same. When they are finished, students are invited to take a wing in each hand and fly around the room. As they slowly dance, Somerville asks a member of the group of 7 to fly away, never to be seen again. She asks the question, "How many of the same colored, beautiful butterflies are left?" The class answers 6. She repeats the same process until she gets to the last lone butterfly. When that student flies away, there is no one to take his place. That type of beautiful butterfly is gone forever, and thus extinction is forever.
3. One way to help students understand spatial relationship and proximity is by creating body maps. Think of the large and small countries that make up a continent. Combine your geography classes and assign different-sized groups a specific country. Have each group arrange their bodies on the floor to represent the outline of that country. Now with the help of a group of student facilitators, have these individual countries come together into a collective whole. The next day have each country wear the same colors, in contrast to their neighbors. Repeat the process and take a

picture of a living continent from an elevated location. This activity resembles a living jigsaw puzzle. Students understand the relationship between the parts and the whole better if physical activity is involved.

4. Just as students learn to see the big picture, teachers will benefit from stepping back from their daily lesson plans and trying to fit them into a larger whole. Consider meeting as a unit, team, or department to come to consensus on the 10 big ideas taught in a subject area. This top 10 list of concepts, themes, topics, and skills should then be broken down by month. Share with other staff members and compare lists. You will be surprised at how much common ground can be connected.
5. In literature, students may be overwhelmed with the details of a particular analysis. In Homer's *The Odyssey,* for example, they see many different sides of Odysseus. It is important for them to step back and see how all these sides fit together as parts of this fictitious character. They will be able to focus on the whole by being asked to identify five highly descriptive adjectives that sum up Odysseus's personality. Based on these broad generalizations, students will be asked to write a short defense of their choices by referencing specific examples from the poem. This activity, by the way, is essentially the same as defending a scientific generalization or theory through supporting facts.

Allow for Processing Time

Giving students time to connect facts with concepts allows time for big ideas to develop.

As we emphasized earlier in this guide, linking information and facts to concepts, themes, and big ideas requires time and reflection to make meaning. Because the academic standards were written more at a conceptual level, the move toward learning for understanding is clear. Coverage of facts and topics in isolation is not the goal, and neither does more coverage lead to greater understanding. Giving your students time to connect facts with concepts allows time for those big ideas to develop.

Applications

1. There is nothing inherently wrong with quiet time. Students need the opportunity to reflect on what they are learning. They must sort, codify, and relate new sensory data and information to past learning experiences. This can be structured by giving students a few minutes to think about possible solutions to a problem before providing an answer. Reflection can also be open ended when teachers build journal writing or reflective commentary into their daily lesson plans.
2. A rule of thumb is that 20 minutes of direct teaching of new information is about the limit that student attention can remain focused. Consquently, build in opportunities for review and application of new learning several times during the class period. One way to do that is with an activity called "Three o'Clock Buddies." Students identify classmates sitting at the three, six, nine, and twelve o'clock positions around the room. They become their "buddies" for the week. Periodically during the class period or day, have

buddies pair up to discuss their reaction to questions that require them to process what they have seen, heard, or felt. By having students discuss while standing up, blood flow and energy are stimulated, thus refreshing them not only for this discussion but also for the next learning segment.

3. One of the best ways to learn something is to teach it to a small peer audience. Ask students to summarize the three most important things they remember about a recent lesson. How would they introduce the material to their "students"? Have them plan a participatory activity to get others involved in the learning process. Focus on the development of key concepts that they would like their students to learn. Stress the importance of major ideas, themes, and connections. Give students enough time to prepare a minilesson and have them actually teach it. This process clarifies their thinking and allows them to learn at a deeper conceptual level.
4. Many students perform best when they are standing and moving. The next time students are reviewing material, pair them up and have them take a "language walk" around the school building. You will be surprised on how effective this focused exercise can be in reflection and reinforcement.
5. The most frequently asked question around the dinner table for those families who have school-aged children is "What did you learn in school today?" Teachers can prepare students to answer by having them summarize specific learning that took place that day. This can be done individually or in pairs, but practicing by orally sharing that overview with a partner usually gets better results.

Promote In-Depth Interdisciplinary Learning

To put this into the words of a 30-year classroom veteran, "It's not how fast you go, it's how deep the student digs into the meat of a topic that is important." Nobody is satisfied with overgeneralized and superficial exposure. Standards actually offer us the unique opportunity to cover less by requiring us to refocus on content and performance expectations. Teachers need to identify and apply aligned standards from the different subject areas to increase the application of multifaceted content and skills to real-world inquiry. Offer choice, direction, and freedom to explore. Complexity of interpretation can come only from reasoned judgments based on in-depth understanding.

Complexity of interpretation can come only from reasoned judgments based on in-depth understanding.

Applications

1. Senior projects are an excellent capstone experience that provides extended investigation, and synthesis. With the assistance of a faculty advisor, graduating seniors identify a community-based project that will positively affect their locality. Based on careful research, students develop an action plan that is presented, using appropriate speaking techniques, to a panel of reviewers. Constructive feedback is given and frequently incorporated into the final proposal. Once edited, the proposal is bound,

signed by the student, and submitted to a local agency for its consideration.

2. The ability to stay within a different persona is a highly appropriate way to develop multiple perspectives, empathy, and divergent thinking. Tell your students that each of them is hosting a "dinner party" revolving around issues associated with astronomy. Each of them will attend the party and can invite only five guests. After researching possible options, they make a list of their five dinner guests and explain why each was invited. In groups of five or six, they then prepare a role play. During a fictitious dinner, invited scientists and philosophers such as "Galileo Galilei," "Albert Einstein," "Kepler," or "Aristotle" discuss the origin of the universe, or "Hawking," "Copernicus," and "Newton" discuss planetary motion and the concept of time in space. Such role plays can, of course, be prepared around a great number of issues in different subject areas.
3. Diary entries in either English or a second language are a good medium for reflection, critical thinking, and clarifying feelings. Ask your students to make and defend analogies that they developed related to a set of moral dilemmas. As they investigate the dilemma more fully, does the analogy change? Which metaphor describes their feeling about a topic of inquiry that has high relevance and connectiveness?
4. A physics teacher, during a unit on rotational motion, brings tumbling mats into his classroom (or takes his students to the gymnastic workout area). A well-skilled gymnast and coach (for stop-action spotting) demonstrate the relationship between rotational speed and radius. Various somersaulting and twisting exercises are done, some in slow motion, with the aid of the spotter. The physics students not only see up close the applications of the principles they are learning in class, but they also develop an appreciation of gymnastics, diving, and figure skating on television. The connection of abstract mathematical calculations with observation of events puts learning in context and enables deeper understanding.
5. Connie Bodeen, of the University of Wisconsin–Marathon County, has developed an interdisciplinary four-hour lesson that introduces the design and composition of the local community. Through a combination of hands-on, interactive studies, students learn about their community and begin to identify what components make a good neighborhood or downtown. Titled the Community Design Game, the interrelated lessons were initially utilized as part of the downtown revitalization project in the village of Oregon. As the game unfolds, students analyze current conditions and future possibilities and then formulate recommendations for the improvement of the community. Working from a map of the designated area, small groups identify several points of interest that can be experienced utilizing a number of their senses. Referencing a large 30-by-36-inch Regional Planning Commission map that will be used as a game board, students create a list of questions that other pupils will take and respond to as they walk the route. On the day of the walking tour, students answer their assigned questions. Students are encouraged to bring cameras with them. If they do, have them write a sentence or two describing why they have chosen to take a particular picture. After the walking tour,

have students reconvene and share their observations and responses with each other. They are now ready to begin working on the large game board. Each group is given a set of game pieces made of colored paper that are marked with the names of various elements (i.e., busy, quiet, narrow, wide, sidewalks, smells, sounds) and buildings (i.e., grocery store, school, park, homeless shelter). They identify which are appropriate to their designated area by placing the game pieces on the map. Each student should be encouraged to look through the various elements and physical structures and those they would add to benefit the community. The activity ends with students summarizing their group maps and associated recommendation.

All Quiet on the Western Front*

> *The following section exemplifies several of the strategies discussed in this section at greater length than each of the previous activities. As you read through these pages, think of more and perhaps better ways to connect the content to the learner.*

Let's assume that you have been in contact with a social studies colleague and you both agree on the merits of a common German language–history classroom involvement. Philosophically and pragmatically, you both acknowledge the merits of visiting a single topic or theme over a similar time frame … yet there is uncertainty on what to use as a common denominator. As a German teacher, you know that most of your students are not in both classrooms and realize that this effort in interdisciplinary cooperation must enhance learning objectives in a world or U.S. history curriculum of which you have only tangential knowledge. Conversely, the same can be said of the social studies instructor, who must grapple with what she can offer to students of the German language which, in many cases, is alien to her.

A proven resource for connecting social studies and German language is Erich Maria Remarque's epic antiwar novel, *All Quiet on the Western Front*. In my 25 years of teaching, no other supplement has been as valuable in depicting the horror, disillusionment, and bond of comradeship that grew out of World War I.

The novel is highly appropriate as a focal point for both German language and social studies classroom instruction. It is concise, episodic, and readable. Written by a German survivor of the conflict, it was first published in 1929 and is available in both German and English. More important, it documents for the student of history and language the emotions, harsh realities, and human qualities of a generation torn by total war. Its universal appeal is demonstrated by the fact that the English edition was reprinted 24 times during its first year of publication.

In 1930, *All Quiet on the Western Front* was made into an Academy Award–winning movie that is available in both 16-mm and videotape format. This earliest version of the film offers students a media perspective on World War I made only a decade after the guns fell silent. Used in conjunction with the novel, Lewis Milestone's classic film personalizes the betrayal of innocence through its protagonist Paul Baumer. Surrealistic battle scenes, complete with Paul's alienation and emptiness, make him the quintessential victim of the war.

The film's antiwar message was so powerful that rightist groups and the Nazi Party had it banned after its arrival in Germany in 1930.

The study of World War I and the cultural context of its impact on German thought and future action are vital components of world and U.S. history classes.

World War I is a topic worthy of inclusion in language study as well. Both the novel and film versions of *All Quiet on the Western Front* provide the foundation for interdisciplinary cooperation.

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* This article by Mike McKinnon first appeared in McKinnon 1992.

One approach that has been utilized by participating German language and social studies teachers is to have students read the novel in the target language. In beginning and intermediate language classes, segments of the book are excerpted in German, while students finish the book in English. Both instructors emphasize the human dimension of the conflict and the changes in attitudes that mark the lives of Paul and his friends. During the weeklong course of study, time is allocated for "exchange visits" in which the social studies teacher meets with the German class to examine the historical foundations of the war. At the same time the language teacher is meeting with the social studies class to explain the German educational system and the nationalist aspirations it fosters in Paul and his classmates.

Both classes watch the film, and students draw comparisons to the novel. In some cases the entire movie is shown, while in other situations, major scenes are highlighted. If a video format is utilized, students from German language and social studies classes can meet after school or in a home with a VCR to watch it together.

A bulletin board in each classroom directs student inquiry to conditions at the home front from 1914 to 1918. In the language classroom, conditions in Germany are examined with the assistance of photographs, short quotations, and artwork. Correspondingly, in the social studies classroom, wartime life in Great Britain, France, Russia, and the United States is illustrated. Students from both subject areas are expected to visit the other teaching station and draw appropriate conclusions. A helpful resource in this project is the J.M. Winter's book *The Experience of World War I* (New York: Oxford University Press, 1989). The author divides the volume into four major categories: the politicians' war, the generals' war, the soldiers' war, and the civilians' war. The latter two chapters, with hundreds of illustrations and numerous eyewitness accounts, provide a wealth of suitable information.

A careful reading and analysis of *All Quiet on the Western Front* gives students a mind-set to use in interpreting other primary sources. Consider the following account, cited in *The Experience of World War I*, of a French corporal who saw service on the Belgian-French border:

> August 22, 1914. A salvo bursts over the road. A horseman quits his stirrups, rolls off his mount, lies still. Quickly, going back from the effect to the cause, we become conscious of impending danger. The first victim, this hussar done away with in a second, disconcerts us. We knew there were some killed in every battle, and yet we were all in such a joyous state of unconcern that we were dumbfounded in the presence of this sudden misfortune. I see the smile congeal on the lips of my comrades. The bursts approach a hundred yards nearer. Now we look at these wicked little clouds less with curiosity than with apprehension. . . . Suddenly shrill hisses which end in violent chuckles send us face against the ground, terrified. The salvo has just burst above us. Shot and splinters sail through the air, a big metal case comes whizzing and strikes the ground near my knee; instinctively, as if to ward off a blow, I had put up my arm to protect my face. . . . More explosions. The balls rain, ricochet on the mess bowls, a canteen is pierced, squirts out its wine; a fuse hums for a long time in the air. With my head under my pack, I cast a glance at my neigh-

> bours; breathless, shaken by nervous trembling, their mouths are contracted in a hideous grin, their teeth chattering: their faces convulsed with terror recall the grotesque gargoyles of Notre-Dame: prostrate in this bizarre position, with arms crossed on their chests and heads down, they look like condemned men offering their necks to the executioner.
>
> Winter (1989, 2)

Ask students to identify a similar sequence in the Remarque novel and hypothesize on the myth and reality of combat, or have your students in German or English analyze the meaning of the famous song "The Watch on the Rhine."

FROM *THE WATCH ON THE RHINE*

There sounds a call like thunder's roar,
Like the crash of swords, like the surge of waves.
To the Rhine, the Rhine, the German Rhine!
Who will the stream's defender be?

Dear Fatherland, rest quietly.
Sure stands and true the Watch
The Watch on the Rhine.

To heaven he gazes.
Spirits of heroes look down.
He vows with proud battle-desire:
O Rhine! You will stay as German as my breast!

Dear Fatherland, etc.

Even if my heart breaks in death,
You will never be French.
As you are rich in water
Germany is rich in hero's blood.

Dear Fatherland, etc.

So long as a drop of blood still glows,
So long a hand the dagger can draw,
So long an arm the rifle can hold,
Never will an enemy touch your shore.

Dear Fatherland, etc.

Ask your students how Paul would react to the song at the start of the war. What specific changes in the lyrics would he make in 1918? Explain why. Or record the thoughts of two soldiers in 1914 on the chalkboard:

Happy are they who die for they return
Into the primeval clay and the primeval earth
Happy are they who die in a just war,
Happy as the ripe corn and the harvested grain.

—Charles Péguy

Come and die, it'll be great fun.

—Rupert Brooke

Ask your students to discuss these conclusions as they relate to the first month of the war. How might these ideas change with the slaughter and stagnation of trench warfare?

Finally, the most famous image in the original film version of *All Quiet on the Western Front* is the hand of Paul Baumer reaching for a butterfly just as he is shot by a sniper. Have your students read the last paragraph of the novel. Upon completion, have them explain to a classmate how they, as a filmmaker, would depict the death of Paul. Discuss with the students these possible options, emphasizing how his killing might be a representation of the war. Show them the end of the movie and critique the appropriateness of their ideas vis-à-vis the butterfly analogy.

As a culminating point in discussion, identify with your students other powerful pieces of literature and film that magnify the human condition in war. The German film *The Bridge* is highly suitable for comparison and contrast.

Make It Work! Tip

U.S. and world history classrooms tend to follow either a chronological or thematic framework in curriculum delivery. Most common is a standard survey course that encompasses either two or four semesters in length and moves sequentially from one historical period to the next. Early initial planning is a necessity to identify when World War I will be addressed. In many situations, it is examined during the first quarter of second semester. Whatever the case, establishing a common time frame for interdepartmental focus is a prerequisite for successful cooperation.

REFLECTION

Apply What We Learned about Meaning

Let's take the principles identified in this chapter and apply them to lesson strategies associated with the novel *All Quiet on the Western Front*. Use the following checklist to review which principles were used. Discuss and compare your responses with a colleague.

Other questions you might consider:

1. Which of the strategies described in the following overview do you feel would be most effective in making the realities of World War I meaningful to a high school student audience? Why?
2. Describe two additional strategies that in your opinion would add greater meaning and connectiveness to this unit of study.

Other comments

Checklist

The following checklist can be used to review the extent to which the eight principles highlighted in this chapter are incorporated into your teaching.

1. Is your unit or lesson taught within a clear and appropriate context? ☐ Yes ☐ No

2. Do the related objectives and activities build on a student's prior knowledge and experience? ☐ Yes ☐ No

3. Are opportunities provided to transfer and apply learning to real-world situations outside the classroom? ☐ Yes ☐ No

4. Are conscious attempts made to connect learning and emotions? ☐ Yes ☐ No

5. Can the student discern patterns and relationships between curriculum content, concepts, and skills? ☐ Yes ☐ No

6. Are attempts made in lesson design to provide multiple sensory opportunities to clarify how the individual parts of a unit fit into a coherent whole? ☐ Yes ☐ No

7. Is adequate time allotted for students individually or in small groups to process new learning? ☐ Yes ☐ No

8. Are opportunities provided for in-depth, interdisciplinary learning? ☐ Yes ☐ No

Other Comments

Best Practice Profile

The 4MAT Model of Instruction

Bernice McCarthy (1996) developed 4MAT, a powerful visual model and tool that can be used in establishing meaning and connecting learning to knowledge and skills. The model is based on the assumption that teachers must understand the natural cycle of learning. Teachers have used 4MAT as an instruction model for two decades.

4MAT offers teachers a method for broadening their delivery of instruction and assessment. It specifically encompasses strategies that appeal to the diverse approaches that learners have to the learning process. The 4MAT method requires that teachers break out of the traditional lecture approach of lesson design by using more active learning processes and strategies as well as more reflective modes of teaching. The basic premise of 4MAT is that although students favor different places on the 4MAT cycle according to their learning, they all need to go through the four major steps, which begin by asking these questions:

Title: The 4MAT Model of Instruction
Source: All About Learning, Inc.
Author: Dr. Bernice McCarthy

Connecting Elements

- Establish personal meaning
- Connect content and learner
- Make teaching compatible with how the brain learns
- Recognize learning style preferences
- Encourage active learning

CONNECT Latin: *co* (with) + *nectere* (to bind)
Establish a relationship between the learners and the content by connecting it to their lives—not telling them how it connects but having something actually happen in the classroom that will bring them to make the connection themselves. The experience must encompass the heart of the content.

ATTEND Latin: *ad* (to, toward) + *tendere* (to stretch)
Have students analyze what just happened from the connect experience; attend to their own experience and to the perceptions of their fellow students—how it went, what really happened.

IMAGINE Latin: *imaginari* (to form a mental picture)
Encourage your students to picture the concept as they understand it.

INFORM Latin: *in* (in, into) + *formare* (to form, shape, mold)
Inform students of the content they need to understand.

PRACTICE Late Latin: *practicus* (capable of being used)
Provide time to practice skills. Create practice that is fun yet demanding.

EXTEND *ex* (out of) + *tendere* (to stretch)
Encourage students to be innovative. They know enough to begin playing with the content, the skills, materials, ideas, and the wholes and the parts to be interpretive and to infuse their own thoughts and ideas.

REFINE *re* (again) + *fin* (the end, limit, boundary); French: *raffiner* (to purify)
Ask students to propose an extension of the learning into their lives and evaluate that extension.

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PERFORM *per* (through) + *form* (form, shape, mold); Latin: *per* + *formare*

Require students to perform for this is where the content takes a new shape, as it is formed through the learners' eyes. Look for originality, relevance, new questions, connections to larger ideas, skills that are immediately useful, and values confirmed or questioned anew.

These eight descriptions help teachers develop strategies that create a cycle of learning. An effective instructional and assessment sequence requires learners to develop a broad range of skills. By widening the methods for measuring and displaying learner performance, everyone has an equal chance to succeed in learning.

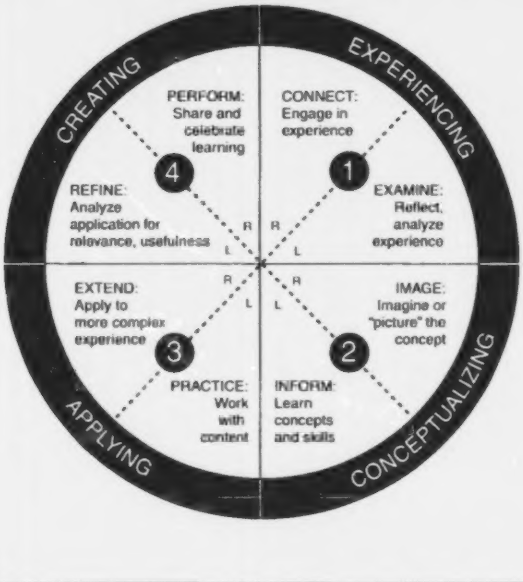
Why is this important to learn? Here the learner connects and attends to personal meaning of the concept being introduced.

What is the concept? This is the traditional focus we find in the classroom, informing the learner what is important to know.

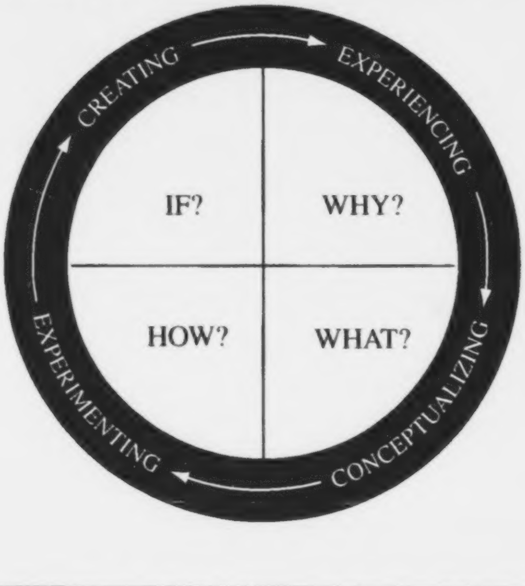
How can the learner use this? The application of knowledge is essential. The learner finds out how this information fits into the real world and how it can be applied.

What are the possibilities? The final step in the learning cycle asks the learner to create new possibilities of the concept. This is where the transformation of learning takes place and the learner takes the information and makes it his or her own.

The 4MAT System: A Cycle of Learning


EXPERIENCING
CONCEPTUALIZING
APPLYING
CREATING
CONNECT: Engage in experience
1
EXAMINE: Reflect, analyze experience
IMAGE: Imagine or "picture" the concept
2
INFORM: Learn concepts and skills
PRACTICE: Work with content
3
EXTEND: Apply to more complex experience
REFINE: Analyze application for relevance, usefulness
4
PERFORM: Share and celebrate learning
R
L
R
L
R
L
R
L

The 4MAT System: A Cycle of Learning


EXPERIENCING
CONCEPTUALIZING
EXPERIMENTING
CREATING
WHY?
WHAT?
HOW?
IF?

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The 4MAT model is broader in design and encourages teachers to go beyond delivering content through lecturing. It begins with the creation of personal meaning for students and proceeds to conceptual understanding, applications, and finally integration. Students experience their most comfortable place in the cycle depending on their learning style preferences while being led toward using learning approaches that are more challenging for them.

In addition to identifying the four major elements of learning (meaning, concept, application, and creation), the model uses both right- and left-brain teaching strategies. Most schools emphasize left-brain thinking (sequential, segmental, and essentially verbal) and ignore the right-brain strategies (synthesis finding, creating spatial relationships, using images, perceiving wholes from collections of parts, hands-on exploration, and dimensions of nonverbal reasoning). It is the use of both modes—so essential for excellence of learning—that educators must seek to balance.

Once the left- and right-brain strategies are added to the four major elements of learning, McCarthy's eight-step 4MAT system emerges. It is best summarized with the following eight words: *connect, attend, imagine, inform, practice, extend, refine,* and *perform.*

Rusch Elementary School

Rusch Elementary School, located in Portage, Wisconsin, is designed to serve families who live within walking distance. The building itself was once the district high school and later a junior high. The elementary school became a reality in the fall of 1998, with both teachers and administrators designing the program with a vision toward how students learn.

The teachers decided that the 4MAT system would be a key component to creating a common language for all to use. Each teacher and administrator agreed to and participated in the ongoing systematic professional development required to build the common language. The teachers, support staff, administrators, and parents became stakeholders in understanding how people learn through this approach.

Teachers created an action research project to discover the significance of using this model. The administration guaranteed five years of support and granted implementation days that provided teachers with more time to develop lessons. In addition, each month the teachers met with a 4MAT trainer to guide the process.

Teachers received four different levels of seminars specific to the 4MAT system. All staff attended a two-day retreat during the summer to build a sense of community. Each day was designed according to the 4MAT system's cycle of learning. During the year, the teachers met monthly to implement new strategies, and each teacher attended a two- to five-day seminar depending on what level of training they last completed. At the end of each year, data collected was analyzed during these implementation days. Some staff took two days for an additional data retreat session during the summer. Other staff presented their story at an international renewal conference attended by others who had been trained in the 4MAT system.

Because each teacher is at a different level of understanding of the 4MAT System, opportunities emerge for more experienced teachers to become leaders. The 4MAT trainers add new knowledge to the process each time the teachers meet. Discovering the standards within the lessons started a conversation of how to connect the curriculum. Teachers were immersed in conversation about conceptualization of their lessons. The assessment tools created gave the teachers an opportunity to discover how a variety of these tools provide so much information about what a student knows and is able to do. More assessments of student progress became evident both from the teachers and the students themselves. This benefited both the teachers and the students in understanding how they learned.

Data was collected from four different sources: students, teachers, parents, and administrators. Each teacher had multiple opportunities to disaggregate and analyze the data with the outside consultants. Analysis of the data provided a path as to the next step in the process of learning how others learn and what significance it makes for those students at Rusch Elementary School.

The results of building a community of learners at Rusch Elementary has been profound. The 4MAT design provided the common language for teachers to talk to teachers about teaching and a framework for the reform to take place with teachers, students, and parents.

The process of this project and data collected thus far is available at your request by calling Rusch Elementary School at (608) 742-7376.

Student learning at Rusch Elementary has been enriched by using the 4MAT model.

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How to Overcome Common Objections to Connected Teaching

6

Objections to connected teaching often have to do with lack of time or lack of collegial relationships as well as with an impression that state standards and assessments lead to fragmentation. This chapter makes suggestions for resolving these objections and working toward connected teaching and learning that sees standards and assessments as an opportunity, not an obstacle.

Consider this comment from a 20-year veteran high school teacher: "I feel like I am on a treadmill that is going faster and faster—standards, state tests, alignment, technology, performance assessment, rubrics, differentiated learning, accountability—I'm out of breath, overwhelmed and frustrated. I just want to close my door and do what I do best . . . teach!"

Content and performance standards as well as mandated assessments have redefined curriculum and assessment along with how the teachers in a department, school, and district work together to strengthen student learning.

Teachers must be competent in the subjects they teach and be open to how this knowledge interfaces with the major concepts, themes, and content core of other classes that make up a pupil's daily schedule. Foremost, teachers must be willing to help students construct links that extend beyond the subject specific classroom.

Teachers must be willing to help students construct links that extend beyond the subject specific classroom.

This chapter lists some practical and proven strategies for facilitating connected teaching and learning through cooperation among teachers. As discussed in chapter 3, many intradisciplinary connections can be made within one classroom by one teacher. In many cases, however, curriculum connections require the cooperation of teachers from different subject areas. Most of the strategies on the following pages are designed to overcome roadblocks to connecting with other teachers and other school disciplines.

Previous chapters in this book have argued that students learn better when they see connections across fields of study and when the material relates to their lives. The following chapters concentrate more specifically on examples of curriculum coordination and standards-based connections across school disciplines.

Concerns such as those expressed by the teacher quoted earlier point to some of the roadblocks on our path to connecting the curriculum. Time, turf, and trust often become issues as well as a general perception that standards and state assessments seriously jeopardize efforts to connect curriculum and instruction.

The Three Ts: Time, Turf, and Trust

Three roadblocks may restrict or limit efforts in connecting the curriculum: time, turf, and trust.

Teachers are all expected to teach more in less time, or so it seems. Time and energy provide natural ends to these demands. Cooperation with colleagues from other disciplines provides an elegant solution to this dilemma because collaboration breaks through isolation, invigorates, and energizes. It also provides an opportunity to approach content material from different angles and avoid duplication. Although collaboration eventually creates more time for classroom instruction and provides students with more in-depth learning, it also requires teacher time for planning and coordination.

Professionals rely on, respect, and respond to the counsel of others within their field of expertise. Their common ground is the planning of curriculum and instruction based on common objectives and standards.

Teachers all have their turf, be it a particular teaching unit, a grade level, team, or department. Cooperation helps us expand our turfs' common ground and draws on everyone's content expertise in their disciplines and knowledge of developmentally appropriate activities at different grade levels.

Professional trust is a prerequisite for curriculum connections. From simply co-teaching to full integration, teachers talk with, not at, each other about coordinated efforts to connect student learning. Professionals rely, respect, and respond to the counsel of others within their field of expertise. Their common ground is the planning of curriculum and instruction based on common objectives and standards.

A Snapshot from the Janesville School District: How Teachers Connect

Two hundred Wisconsin (Janesville) middle and high school foreign language, social studies, art, and music teachers were surveyed in 2000 to determine if and how they connected with other teachers. Sixty-four percent of respondents acknowledged that they had been or were currently involved in such initiatives. The vast majority of these were middle-level educators. Ninety-eight percent of those surveyed were positive about making connections. The other 2 percent mentioned lack of time and coverage expectations as reasons why they commented negatively. Among those currently involved in connected instruction, 67 percent thought that with state standards and state-mandated testing, less time would be available for connected instruction.

The following list ranks the most common connections among teachers in the Janesville School District from most to least common practices.

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1. Grade level– or course-specific interdisciplinary teaming
2. Short-term teacher swaps
3. Parallel teaching in addressing a common theme, event, skill, or standard
4. Interdepartmental cooperation on a schoolwide priority (i.e., state assessment expectations)
5. Cross-grade-level projects
6. Joint participation in planning and chaperoning travel opportunities
7. Involvement in cross-disciplinary summer school options
8. Collective attention to items in a portfolio
9. Content instruction from another discipline in the foreign language (Janesville School District 2001)

The following list suggests a few steps that help to prepare the ground for teacher cooperation and connected teaching. They have all been successfully tried out in Wisconsin schools, bringing teachers together and building trust through cooperation.

TWENTY-FIVE THINGS THAT YOU CAN DO NOW

What you can do NOW

1. Hold a joint department meeting where information is shared about standards in each discipline. Identify three complementary areas that are fertile ground for interdisciplinary initiatives.
2. Have each grade level and subject area develop a top 10 list of major ideas and themes emphasized in instruction. Work with your art teachers to create a wall mural that captures the essence of that composite.
3. Request that teachers in different subjects or disciplines author a one-page essay entitled "Ten Things You Should Know about Standards" that summarizes expectations in their field of expertise. Share and discuss.
4. At your next faculty meeting, have members of a different team or department pantomime core concepts and skills that are associated with another discipline. Follow with a focused dialogue on connectiveness.
5. Sponsor a bag lunch for teachers who don't normally eat together to exchange ideas on how to make instruction more meaningful and standards based.
6. Take a first step in interdisciplinary teaching by identifying a common standard that could be mutually taught and assessed with a trusted colleague.
7. Propose a new summer school class where teachers from different subjects and schools or organizational levels design and implement an integrated approach to teaching and learning.
8. Shadow a teacher from a different subject area for an entire day to see possible areas of collaboration.
9. Plan a faculty night out and attend a stage play such as *Les Miserables*. Discuss components of the production that could be used in each classroom.

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10. Have each teacher in your building put questions they have about connected learning on index cards. At faculty meetings, have the assembled teachers discuss the questions.
11. Agree that starting next term, American literature and American history teachers will teach the unit on transcendentalism and slavery at the same time with one common assessment.
12. Surf the Web for a site that has already cross-referenced national and state academic standards.
13. Make copies of the standards from all subject areas readily available for all teachers to review and critique.
14. Ask all students in your school to submit a logo that symbolizes the connectiveness in their learning. Solicit similar ideas and prototypes from educators on the interconnectiveness of their teaching.
15. Agree that starting next term, geometry and art teachers will teach a series of lessons on perception and visualization at the same time with one common assessment.
16. Make all future performance tasks real-world in extension and application. Use members of your community in developing scenarios and associated scoring guides.
17. Throughout your school building, hang slogans that reinforce the value of connected learning. Use visuals—peripherals, posters, slides—to reinforce the message to students and staff.
18. Select one performance standard from each of the state-assessed disciplines that must be infused and reinforced in all classes. Create a display of related student artifacts that denotes the diversity and range of application of that standard.
19. Give a copy of subject- and grade-appropriate performance standards to your students. Have them rewrite them in their own words. Once this task is completed, have them work with a partner and identify how these student-friendly standards could be taught in different classrooms throughout the building. Share their best thinking with appropriate staff.
20. Agree that starting next term, science and family and consumer education teachers will teach a unit on the chemical and physical composition of different types of foods with one common assessment.
21. Challenge teachers to prove wrong their own negative beliefs about interdisciplinary learning. Ask them to pair up and share reasons why these assumptions about connectiveness might be faulty and what they plan to do about it.
22. Take a walk with predetermined pairs of educators and administrators. Discussion can focus on general issues and concerns about interdisciplinary learning.
23. Arrange an off-site field study where students from different classes visit the same location and investigate a complex topic or issue through the lens of each discipline. In the afternoon, have them draw together these different perspectives through an interdisciplinary exercise.
24. At the next faculty meeting identify two specific academic standards that have multidisciplinary potential. Mix teachers and administrative team members in groups of three or four. Share what is currently done in each

grade level or subject to comply with the intent of these standards. At the conclusion of the exercise have a sampling of the groups share their ideas for possible implementation.

25. Use back-to-school nights to demonstrate to parents how learning is connected in your building. Focusing on a familiar standard or conceptually based theme, have each instructor describe how it fits into their instructional design and assessment package.

REFLECTION

List three to five additional ways to bridge time, trust, and turf. Share these thoughts with your colleagues and decide which of these suggestions you would like to implement.

School accountability recognizes a collective responsibility for teaching what is important by demonstrating that the associated skill or concept is important in a variety of subjects and situations.

Standards, State Assessment, and Accountability: Three More Roadblocks to Connections?

Public school policy related to standards, assessment, and accountability should not be the wedge to drive apart connections; rather, it should be a vehicle to bring disciplines together. Increased emphasis on student achievement demands that teachers look for ways to reinforce important knowledge and skills across the school subjects. School accountability recognizes a collective responsibility for teaching what is important by demonstrating that the associated skill or concept is important in a variety of subjects and situations. That task can be accomplished only if alignment and reconfiguration are seen as an opportunity.

As schools move into a standards-based curriculum, instruction, and assessment design, three practices emerge that enhance achievement:

- ☐ Standards are the basis of instruction
- ☐ The associated thinking skills aligned to the standards provide the opportunity to connect learning at the concept and process level.
- ☐ All teachers have responsibility for meeting the state standards evaluated on state tests.

We argue that required standardized assessments at grades 4, 8, and 10 offer unique opportunities to plan together for success. Every teacher in a building has a responsibility to prepare each student for the next level of classroom and state assessment. In some situations this means that fifth grade elementary teachers will work with middle-level colleagues in addressing performance expectations identified at Grade 8.

In reviewing the composition of state assessment, the Curriculum and Instruction Department in Janesville, Wisconsin, identified the following tasks most commonly referenced in the Wisconsin Knowledge and Concept Exams (WKCE).

The Most Frequently Assessed Tasks on the WKCE

- Using and interpreting graphs
- Making inferences
- Using map and globe skills
- Defending an idea
- Critiquing a solution
- Determining cause-and-effect relationships
- Writing for different audiences and for a variety of purposes
- Developing constructed responses
- Critically analyzing written and other visual material
- Editing for mechanics and sentence structure
- Evaluating and extending meaning
- Synthesizing information and ideas

These findings suggest that the WKCE does not force teachers to teach to the tests separately and in isolation in each subject area. All tasks can be used in several disciplines. Instruction in different subject areas contributes to student learning in profoundly similar ways. Different disciplines can be connected through these tasks, and teachers will find that these connections actually give them and their students more time to add some discipline-specific information to these general tasks.

This listing was then used by a collaborative group of social studies and language arts teachers who developed a practical set of recommendations for instruction in both disciplines at the high school level.

Ten Things All Teachers Can Do

1. Ask more "if" and "how" questions than "what" questions.
2. Have students gather, process, and interpret relevant data.
3. Construct mental maps.
4. Write more short, clear, cogent responses that support an idea or conclusion.
5. Interpret historical and contemporary photographs to enhance a sense of time, place, and sequence.
6. Increase the use of diaries, letters, journals, and other primary sources.
7. Graph more.
8. Infer more.
9. Defend more.
10. Expect more.

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In coming to these conclusions, group members

1. Reviewed and discussed performance standards in each discipline area.
2. Identified commonalties in content and skill expectations.
3. Reviewed and critiqued the WKCE summary of test design in social studies and language arts.
4. Took the social studies and language arts sections of the eighth and tenth grade WKCE examinations *together* and did an item analysis of the purpose of each short-answer question and constructed–extended response.
5. Compared their findings with "The Most Frequently Assessed Tasks on WKCE" handout.
6. Developed their recommendations.
7. Identified, with their building administrators, joint department meeting dates where progress in meeting these recommendations could be ascertained.

Their collaboration built mutual trust and professional respect, and it helped teachers overcome the perception that all assessments are roadblocks to connections. Connections across disciplines and improved connected instruction depend on such activities.

REFLECTION

Select one or two of the suggestions on page 63 and identify ways in which you can incorporate them into your classroom.

Best Practice Profile

Making Connections: An Exercise in Interrelationships and Inference

This multifaceted instructional strategy attempts to draw meaningful relationships between sets of terms associated with topics and themes under study. The concept behind this strategy is similar to the game Tri-Bond. To use this strategy, select triads of terms drawn from a unit or units of study, asking students to establish a relationship among the items in each set. Once this task is completed, students should identify the significance of the connection and use it to make an inference about its importance in the real world. For example, the following triads of terms taken from the Wisconsin Mathematical Standards offer a fertile ground for student response and inference.

Title: Making Connections—Interrelationships and Inference

Related Standards

- **Mathematics:**
  A–12.1 Use reason and logic to identify relationship.
- **Foreign Language:**
  F–1 Use topics and skills from other subjects to discuss and write in the language studied.

Skills

- Infer
- Associate
- Classify
- Synthesize
- Conceptualize

Percents, proportions, ratios
Symmetry, congruence, similarity
Frequency, symbols, conventions
Algebraic expressions, equations, real-world problem solving
Patterns, linear, nonlinear
Mathematical process, number operations, measurement
Exponential, mathematical function, quadrates
Solution, justification, counterexample
Fractions, decimals, percents
Real numbers, ordinal scale, order relations
Length, height, volume
Pythagorean theorem, generalizations, right angles
Symbols, $N + 0 = N$, letters

Here's one student's response to the set (symmetry, congruency, similarity):

> The fundamental intent of mathematics is to be able to describe things in the natural world. Once described, we can use things, record their use, or predict how they may be used. One example of this lies in the ability to determine how alike or how different two- or three-dimensional objects may

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> be in comparison to one another. The tools that mathematics gives us for this are concepts such as symmetry, congruency, and similarity.

The objective of the lesson is not an extended dialogue on possible relationships but rather the general recognition of linkage of concepts and skills that the student may have grasped only in isolation.

Student responses range from the more obvious, direct, and anticipated to the less obvious, indirect, and unanticipated. Initially, pupils attempt to make a literal association around a specific topic or theme. This is an appropriate first step, but encouragement must be extended to elicit further elaboration on the meaning of their connection. Simple relationships convey little understanding of the sets. An example of this would be a response such as "The three terms deal with math." More constructive commentary can be centered on answers that reflect a core basis of awareness, for example, "They all deal with measurement." Ask the students questions like "What do they mean by measurement? What specific elements of the three terms made them choose measurement? How does each term fit with the overall qualities of measurement?"

The less obvious and unanticipated student response reaches further and challenges the thinking of student and teacher. This response may be subtle and indirect. It may even be something you never thought of in your lesson plan. Remember that when we ask students to construct knowledge, we cannot predetermine the condition that it be our thinking, our connection.

Figure 6.1 presents a number of sample sets that can be used in drawing general inferences about Germany's past, present, and future. The degrees of abstraction reflect an attempt to promote the use of a variety of lower- and higher-level thinking applications in second language and social studies classrooms.

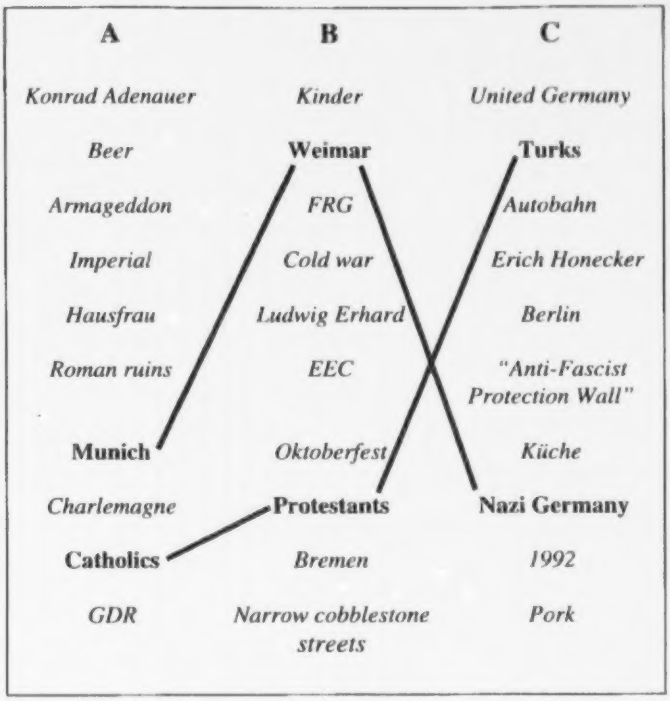
German language items are included to add richness to the exercise while pragmatically demonstrating the value of second language ability in analysis, synthesis, and evaluation.

There are numerous modifications that an individual teacher can use to reflect his or her own preference. Some instructors have found it easier to work with pairs of terms rather than sets of three. Others considered using a fourth space for students to add their choice in extending meaning. Another alternative is to mix up choices in vertical columns (A, B, C) and have students make their own links by connecting and explaining items in each.

Typical student response number one: *Catholics, Protestants, Turks.*

> The Christian population of Germany is currently divided between Catholics and Protestants. Most Catholics live in the south, while most Protestants live in the north. Since World War II many Turks have come to Germany. One and one-half million of these are Muslim. Germany is made up of many different religions.

Typical student response number two response number one … *Munich, Weimar, Nazi Germany.*



A	B	C
Konrad Adenauer	*Kinder*	*United Germany*
Beer	**Weimar**	**Turks**
Armageddon	*FRG*	*Autobahn*
Imperial	*Cold war*	*Erich Honecker*
Hausfrau	*Ludwig Erhard*	*Berlin*
Roman ruins	*EEC*	*"Anti-Fascist Protection Wall"*
Munich	*Oktoberfest*	*Küche*
Charlemagne	**Protestants**	**Nazi Germany**
Catholics	*Bremen*	*1992*
GDR	*Narrow cobblestone streets*	*Pork*

FIGURE 6.1

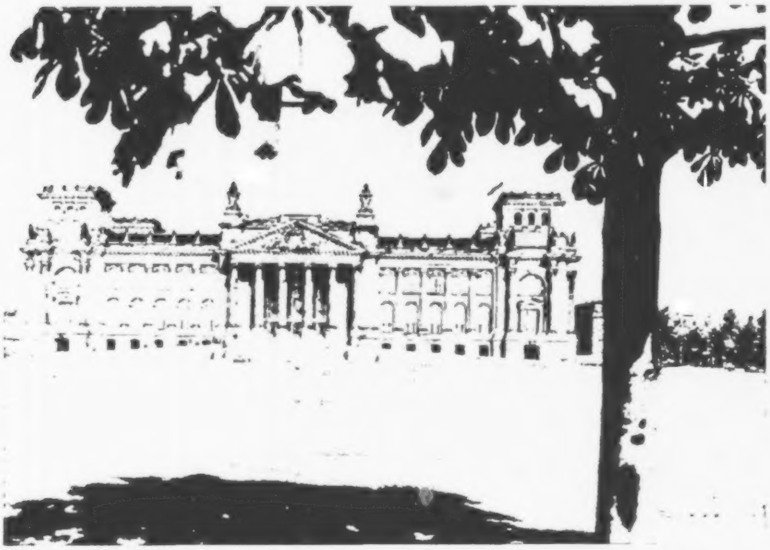


FIGURE 6.2 **This picture of the Reichstag before its restoration in the 1990s can be linked with phrases such as "Shadow of History" and "European Community." Students are asked to elaborate and justify those links.**

> In 1923, Hitler led the Nazis in an attempted coup in Munich. The coup against the government of the Weimar Republic failed and Hitler was imprisoned. While in jail, he wrote *Mein Kampf*, setting forth his views. *Mein Kampf* became the guidebook of the Nazis.

Using this model, students will make the connections based on their knowledge and understanding. Because this exercise is meant to be open-ended, students, working independently or in small groups, are encouraged to identify a number of possible associations.

German language and social studies teachers may alter the activity by providing visual representations for student analysis and interpretation. In place of term lists, photographs of historical events, artifacts, and personalities could be intermingled with written vocabulary. Another option is to develop sets of photographs that students must connect with associated rationale and justification as shown in Figure 6.2. In order to use this activity in the foreign language classroom, the teachers will supply the German words. Student work would be expected to be in German.

This technique has proved to be a valuable tool in encouraging discussion and high-level thinking because it asks students to connect and contextualize facts.

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Making Connections through Technology

7

Technology has changed the way in which we access information as well as how we process information into knowledge. This chapter addresses some of the challenges and opportunities for teaching, learning, and the organization of schools that arise from a constantly changing technological environment. The main argument is that modern communications technology changes roles of students and teachers dramatically.

Then and Now—Past and Present

Gutenberg's printing press is often cited as one of the most important inventions in the history of the human race. Beyond its original value and use for the production of books, it generated and distributed knowledge around the globe and among people who had never had direct and unmediated access to books such as the Bible. In similar ways, other inventions such as the car, the train, the jet plane, or spacecraft transcend their immediate and intended purpose of fast transportation. As with the printing press, each of these technologies has had a greater impact on the transformation of human societies than could have been foreseen by their inventors: Each radically changed our sense of place in the universe.

Technology can change the ways in which we look at teaching and learning.

Today, computer and satellite communications technologies transform social and political interactions in ways that we may not fully understand. We can now access vast amounts of information from the computers on our desks, and we are electronically connected to virtually all parts of the world. The advent of this ability to communicate globally has been the most significant factor in moving society from the Industrial Age to the Communication Age. Communications technology has assumed a major role in our society and in our schools, and it will be necessary for teachers and administrators to learn how new technologies can change the ways in which we look at teaching and learning. Understanding what this technological connectivity and immediate access to information means for the learning process in all subject areas should be a central element of professional development.

Technology and Its Different Uses

Technologies such as the blackboard or overhead projectors serve the purpose of making information visible to more than one person in a room. Technological advances such as radio, television, or the video recorder have long had their place in bringing information about the world into the classroom. But some innovations, such as the language laboratories of the 1970s, never became widespread. Perhaps not enough thought was given to connecting that technology with educational goals.[1] Computer hardware and software will in all likelihood not disappear from our schools as long as they have their place in the real world. But just like other professionals, teachers will have to think very clearly about their application and use in the context of learning.

Great new tools are only miracle workers if they are employed by teachers who know what they are doing, welcome the new tools, and understand their greater purpose.
Jamieson A. McKenzie (1998)

What Is the Impact of New Technologies?

Whether we like it or not, we have become a wired (or wireless) society. One of the most important contributions of the Internet is that it provides constant access to information. Because students readily access information without having to rely on teachers, evaluating such information, connecting the data, and making sense of what is available has truly become an educational opportunity. Rather than spending time on gathering information, time can be spent on sorting and evaluating information. Thus, technology frees up learners and educators to focus on higher-order thinking skills. "When combined with traditional sources," writes Jamieson A. McKenzie (1998), "the *Internet* offers remarkable freedom of access to information unless a school or library has chosen to filter, limit and restrict. At the same time, we have learned that Info-Heaven can quickly become Info-Hell if we do not equip our students with the reasoning and exploration skills required to cope with Info-Glut and Info-Tactics. To a large extent, the value of *Cyberspace* resides in the minds of the voyagers."

Three uses of technology are prevalent in education.

1. *Application of software programs.* Software applications such as Power Point, Adobe Photoshop, or design software packages are used in a variety of work places and contribute to the professional appearance of presentations and organization of content. Students should learn how to use these applications in the context of learning in the content areas.
2. *Information access.* The use of communications technology affects the learning process and teacher–student relationships. If students and teachers have an almost infinite number of resources at their fingertips and if students can find their own information from their computer workstations, the role of teachers as information dispensers is virtually eliminated. Although teachers may direct students to Web sites, they will most likely engage students in their own Internet searches. The new challenge is to assist students in evaluating the validity of resources found on the Internet. The refereeing and screening process that we have always expected from librarians and teachers is now relegated to students. More access to information may mean more freedom, but it also requires students to be more vigilant and critical. Consequently, instructional focus shifts to *information literacy.*[2]

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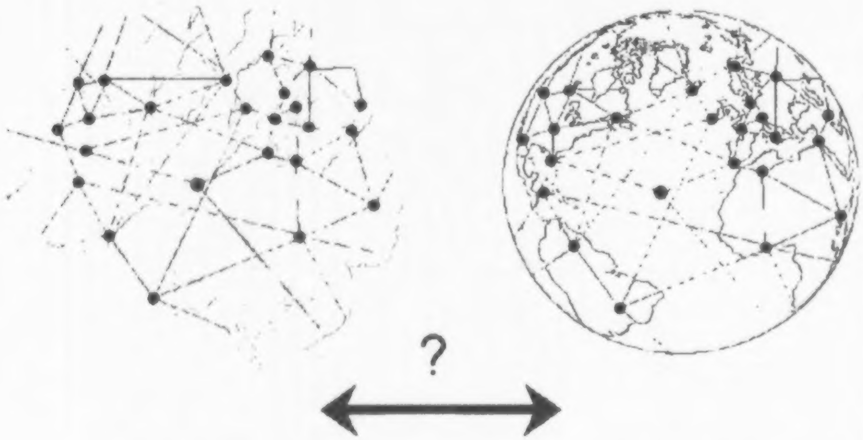
[1] Although most computer software programs were still based on the pattern drill approach, methods in foreign language teaching were beginning to shift to a communicative approach.
[2] Consult the Wisconsin State Standards for Information and Technology Literacy for more information.

3. *Communication.* Students can also communicate with virtually all classrooms and experts around the world. New learning communities can be created through E-mail- and Internet-based communications technologies. Learning through such communities most certainly transcends the walls of the traditional school house. Students can, for example, ask experts in other parts of the world for information. Teachers guide them in this process, but they do not provide all the information. Likewise, students can get in touch with classrooms around the world and learn about traditions and cultures in other societies. They will see the need to communicate in another language more clearly and learn another language not only from their teacher but also from other students.

This is how technology can unite and connect people, and this is how learning taps resources that would not have been available without computer technology. In this way, computers connect rather than separate by changing the dynamics between learner and teacher. Seymour Papert (1996, 149) writes that "nothing could be more absurd than an experiment in which computers are placed in a classroom where nothing else is changed." Computers, after all, have changed many workplaces and our daily lives. We make hotel and flight reservations on-line, check the schedules of our local movie theaters on the World Wide Web and print admissions tickets on our computers, and we chat on-line with friends and business associates around the world. Working with and learning from other people around the world is increasingly possible because computers have become an integral part of our lives.

But what exactly is the relationship between the connectivity made possible by computers and the way in which we learn? "The present World Wide Web," writes F. Heylighen (1995), "is in a number of ways similar to a human brain, and is likely to become more so as it develops. The core analogy is the one between hypertext and associative memory. Links between hyperdocuments or nodes are similar to associations between concepts as they are stored in the brain. However, the analogy goes much further, including the processes of thought and learning."



It is difficult to reconcile the complete openness of learning that is possible through new technologies with the old grammar of schooling.

David Tyack and
Larry Cuban (1995)

Human knowledge is far greater than the knowledge of any given human being.

Interestingly, contemporary thinking in the Western world puts enormous emphasis on the separate and distinct values of human beings. Intelligence is seen as an individual characteristic. At the same time, we know all too well that human knowledge is far greater than the knowledge of any given human being. The advancement of research and the increase in knowledge therefore necessitate making connections among humans both throughout history (which is why records are kept in libraries) and in the present time. "It is an old idea, dating back at least to the ancient Greeks," writes Heylighen (2000), "that the whole of human society can be viewed as a single organism."

Therefore, the kinds of connections made through technology today are highly reminiscent of earlier thoughts on the worth of the individual within the context of human society. We should design learning scenarios that make use of these types of connections wherever and whenever possible. Nontechnical expressions of such learning scenarios are methods of cooperative learning and teamwork. Technology should not isolate, as many critics fear may be its result. Technology should strengthen connections and the recognition that everyone learns better in connection with others. The understanding of subject matter and knowledge as connected and unified will become clearer and clearer through the use of technology.

Implications for the Roles of Teacher and Student

A teacher-directed delivery model assumes far greater authority and control of the flow of information than a student-centered constructivist approach. Direct student access to information and people all over the world as discussed in the previous section amplifies one of the most interesting challenges of education: How can teachers ensure that students have an opportunity to learn much more than they know?

Using technology to its full potential changes the roles of teacher and student.

Using technology to its full potential changes the roles of the teacher and student: Both can move away from the closed circle of information input, retrieval, and reproduction much more easily. In a learning environment where facts and information are so readily available, the emphasis will be much more on making meaningful connections among facts and information bits. Student performance will be measured through thinking skills and conceptual understanding. At the same time, teachers can never be quite sure what information students will find through exploration of Web sites, of books in the libraries, or in their on-line conversations with other students and experts around the world. Practically unlimited access to information and connections with other people adds complexity to the educational process, as more instructional time can be spent on connection information and less on information retrieval.

The real challenge and greatest opportunity for education and learning comes from the connecting qualities of new technologies. Technology connects people, and it connects people to information. The question that teachers need to ask themselves today is not whether they should use technology but what specific technologies have the greatest impact on learning and teaching.

REFLECTION

- Which technologies do I use routinely in my classroom?
- Do my students have direct access to the Internet?
- Do my students communicate with classrooms in other parts of the world through E-mail?
- How has computer technology changed the way in which I teach?
- What are the attitudes of teachers, students, parents, and administrators toward the use of technology in the school?
- How can my students benefit from accessing the World Wide Web in the classroom?
- Other comments

Paul Treuer[3] argues that technology makes it possible for students to be the keepers of their own portfolio. Why not give them the responsibility for keeping track of their own progress and presenting evidence of their achievements? In that scenario, registrar's offices are relieved of much of their current work. Can technology be used similarly in the schools? Can the responsibility of "keeping the books" be shifted to the student?

e-Portfolio: Personal Information Management

It's terribly difficult to "know thyself," as the Greeks espoused, when information about oneself is scattered, like money, in deep pockets of numerous businesses and institutions throughout diverse communities. Ignorance does not derive from the lack of information (or of access to it) or from its inaccuracy. If anything, the abundance of personal information about each of us swirling around the Internet at frenetic speeds creates an atmosphere of information overload. Our ignorance derives primarily from the management of our personal information. Institutions possess more sophisticated tools, policies, procedures, and practices for managing and distributing our personal information than do we, its rightful owners.

The management of educational records typifies how personal record keeping is managed. Other areas, such as medical, legal, and financial records, are maintained and managed primarily by institutions providing these services. Prior to the digital revolution, in a world of paper documents, this was the most pragmatic approach to managing records. For example, it was more efficient for a university to create and store transcripts than to disperse them to students for safe keeping. But now, when it is possible to do so electronically, why isn't the student automatically given a copy of the most current transcript electronically? Why should the university, rather than the individual, maintain records about the student's cocurricular activities? Why should the university, rather than the individual, maintain a record of honors and awards or assessment scores? Why should medical clinics be the sole, or even primary, repository of each person's health records?

They shouldn't! With the advent of the Internet and linked databases, the user should be calculated into the formula for distributing and managing personal information. Not only should each individual get copies of their personal records, but sufficient management tools and skills for accessing and managing personal records should also be provided. The issue is entitlement: Each individual is entitled to easy, full, and direct access to personal records. The issue is control: Each individual should have easy, full, and direct influence over the distribution and use of personal records.

But how do we make the jump from the old paradigm of institutional control to owner control of personal information? The answer is twofold: Create tools that make the distribution and management of personal information by the record owner possible, and teach people the necessary skills to use these tools responsibly. The process should start with educational records because they are aligned with a mechanism for teaching all citizens this important lesson, our educational system.

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[3] Paul Treuer is a professor at the University of Minnesota. He contributed this article for this publication.

An initiative at the University of Minnesota (UM) addresses each of these issues. Portfolio 2.0 is the second phase of a personal database made available to each student, faculty, and staff member for managing personal educational records. This on-line tool is a repository for up to 20 megabytes (MB) of multimedia information per user. It is a secure computing environment with a potential to link to system databases. Portfolio records are encrypted and password protected using X.500 usernames and passwords. Each user can manage their information by selecting Portfolio documents to share with one or more other individuals for specific purposes, such as academic advisement.

The model for Portfolio 2.0 is that each user is provided with a secure Internet database account serving as a formative learning portfolio. As a person progresses through university studies, the portfolio can change to accurately reflect learning outcomes. In this way, Portfolio serves as a dynamic tool providing easy access to, and management of, educational records. In addition to being a formative portfolio account, the UM Portfolio can be used at any time for summative purposes. For example, it can be used for advisement prior to registration. The student-created Advising Portfolio provides the academic advisor with a three-dimensional view of the student's academic profile at a point in time. Included in this view can be, among other entries, biographical information, photographs, official academic records, degree program requirements, an academic plan, and representative multimedia work samples. The utility of the portfolio for academic advising is realized when the advisor discovers this is the most comprehensive set of information about and by a student. And because it is on the Internet, it is readily available anytime, anywhere!

Students cannot be expected to create comprehensive portfolios for purposes such as advisement and employment without assistance. The task of implementing Portfolio 2.0 as a user-controlled record-keeping system is indeed a daunting task. It is entirely appropriate, therefore, that the initiative to implement portfolios is beginning in a formal education setting, such as the university, where students can be supported to maintain portfolio standards for quality of writing, content, and thought.

Turning students from passive to active personal information managers requires a considerable change in how we teach and support learners within our educational communities. What is needed is a pedagogy to help students make this transition. It requires a full spectrum of learning experiences including courses, advising, counseling, e-mentors, cocurricular leadership activities, hiring practices, and service learning need to consistently use this pedagogy to reinforce the cultural shift to user-controlled management of personal information.

At the University of Minnesota–Duluth, an introductory course for freshmen, Introduction to College Learning, orients students to college studies while at the same time guiding them to begin their electronic portfolios. The curriculum of this course includes portfolio standards, examples, and assignments. Faculty and staff need to continue the process of portfolio development beyond freshman year by identifying in different academic disciplines portfolio requirements and mechanisms for supporting students to demonstrate mastery. On-line portfolios are ideal tools for this task because they can contain interesting, colorful, and interactive student work samples. ("Do you want to hear a music composition I wrote and performed? Click here!")

As one UM student recently said, "We are moving from the information age to the information-processing age." It is incumbent upon institutions of higher learning to provide the tools and training necessary to produce active, responsible, personal information managers, people who take their entitlement and power seriously. If the role of educators is to empower their graduates to be informed, responsible citizens, perhaps the most important lesson to be taught, given the current state of the digital information revolution, is the ability to manage one's own personal information effectively and efficiently. How else can a student display one of the most important traits of a learned person, knowledge of oneself?

REFLECTION

- Should students be more involved in keeping and maintaining their (electronic) records?
- What would they have to learn to do that?
- What would the advantages be?
- What are some risks?
- What would those records look like?

Best Practice Profile

WebQuest

Title: All Men Are Created Equal. . . . ?

Source: The WebQuest Page

Related State Standards

History B.12.5 Gather and interpret data related to issues of equality.

Information Literacy B.12.3 Locate and access information sources. **B.12.4** Evaluate and select information from a variety of print, nonprint and electronic formats. **B.12.6** Interpret and use information to solve the problem or answer the question.

Concept(s) Tolerance, equality, justice

Connecting Elements

- Establish personal relevance
- Make emotional connections
- Promote In-Depth Interdisciplinary Learning

In 1995 Bernie Dodge, a professor of educational technology at San Diego State University, developed an innovative approach to using the Internet as an integral part of teaching any subject at any grade level: the WebQuest. Since its conception it has become one of the most popular and widely used on-line resources in linking inquiry and problem solving.

In essence, a WebQuest is a learning activity in which some or all of the information that a student uses in completing a required task comes from varied sites on the Internet. WebQuests can focus on a single topic or can be interdisciplinary. There are two types of WebQuests: short and long term.

In a short-term WebQuest, the instructional goal is knowledge acquisition and integration. Each student obtains and processes a significant amount of new information from the Web and other in-school or community resources in creating Web pages. Short-term WebQuests are designated to be completed in one to three class periods.

In a long-term WebQuest, students extend and refine the knowledge they find on-line by relating it to their own experience. Each student analyzes a body of information, integrates it into their knowledge base, and demonstrates their understanding by presenting it to the class in the form of Web pages. Long-term WebQuests take between a week to a month to complete.

As one Wisconsin educator observed, "WebQuests have cemented the connection between Internet access and my students' ability to review and evaluate different sources of information."

WebQuest activities contain six components:

1. A clear introductory paragraph that frames the activity and provides background information.
2. A specific task that is interesting and meaningful.
3. A set of information sources needed to complete the task.

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4. A description of the entire step-by-step process the student should go through in accomplishing the task.
5. Guidance on how to organize the information obtained.
6. A conclusion that brings closure to the activity, reminds the students about what they have learned, and encourages them to extend this learning into other situations.

Other attributes of a WebQuest include the following:

1. WebQuests are most likely to be group activities, although one could imagine solo quests that might be applicable in distance education or library settings.
2. WebQuests might be enhanced by wrapping motivational elements around the basic structure by giving the learners a role to play (e.g., scientist, detective, reporter), simulated personae to interact with via E-mail, and a scenario to work within (e.g., you've been asked by the secretary general of the United Nations to brief him on what's happening in Sub-Saharan Africa this week).
3. WebQuests can be designed within a single discipline, or they can be interdisciplinary.

The end result of a WebQuest is the students' best work being published on the Internet.

Sample WebQuests include

Artist Self-Portraits
Searching for China
The Planet Earth Expedition
Your First Paycheck
Globe Theatre
Mathart: Connecting Geometry and Art
Vietnam
1960s Museum
Un Jour a Paris
Investigating Archacotype

WEBQUEST: All Men Are Created *Equal* . . . ?*

On July 4, 1776, our founding fathers signed their names to the Declaration of Independence, envisioning a country that would guarantee basic freedoms to all citizens. However, events in American history have not always supported the principles on which our country was founded.

The equality declared in 1776 has been denied to men and women of various races and religions at one time or another. In certain instances, lines were drawn between "us" and "them." Prejudice, discrimination, and intolerance often arose from fear, suspicion, and anger. Understanding, respect, and tolerance will help us to move toward the realization of a "more perfect union."

The Task

Using the suggested resources, you will have the opportunity to gain a better understanding of the experiences of the Cherokee, Japanese, and African American people during their times of struggle. Visit the suggested Internet sites and read both nonfiction and fiction accounts of the people and events. Travel back in time and imagine yourself and your family as members of one of these groups of people; then complete one of the following assignments:

- ☐ Imagine that you are forced to leave your home because of who you are. Then write a minimum of three journal entries describing your departure, journey, and arrival in a new place.
- ☐ Write a letter to the president suggesting that what is going on is unfair and arguing for equal rights for your people.
- ☐ Suppose that you are the editor of a newspaper. Write an editorial describing how intolerance led to the mistreatment of your people. Include suggestions of alternative solutions to the problems.
- ☐ As a witness to the events during one of these time periods, write a poem describing the scene: what you see, how you feel, and what you are thinking.

Resources

WebQuest resource pages will provide you with on-line and print resources that will help you to gain an understanding of the time period, events, and experiences of the Cherokee tribe's removal and relocation, the internment of Japanese Americans during World War II, and the African American civil rights movement.

The Process

There is a Native American saying, "Don't judge a man until you've walked two moons in his moccasins." Because you are not able to walk in the shoes of these people, you must collect enough information to understand what it was like for them.

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*This activity is no longer available onlie. Check the WebQuest site for similar suggestions (webquest.sdsu.edu)

1. Visit each page of this Web site and link to the sites provided. It is not necessary to read each entire site, but gather enough information so you can relate the events of the time periods.
2. Take notes; jotting down your own ideas of how you would have reacted, what you would have been thinking and feeling if this was happening to you and your family.
3. Visit the library media center of your public library to access print resources. Choose a historical fiction book from one of these time periods. After reading the book, compare its historical content with the facts you have gathered.
4. When you have completed your research using a variety of information sources, select and complete one of the writing assignments listed under "The Task."

Learning Advice

The objective of this WebQuest is to enable you to put yourself in the place of the people it focuses on, to look at what happened from their point of view, and to gain an understanding of how intolerance has shaped the events of history.

You may want to start by visiting the time line sites to get an idea of how the events unfolded.

Pay close attention to personal accounts and interviews. These will help you get an idea of what happened to the people involved.

Conclusion

The confrontations you have learned about here were extreme and took place a long time ago. You may not think they are relevant to your life, but is intolerance a thing of the past? Can you find examples of discrimination today—hate crimes, ethnic jokes, barriers to the handicapped?

Today, laws help protect the rights of all Americans, but we must continue to work toward that more perfect union.

What can you do to help?

Making Connections through the Arts

8

The arts are not seen as simply another school discipline in this essay. The discussion centers on the question what contribution aesthetic makes to cognitive learning. The arts should not be separated from other disciplines—they contribute across the curriculum.

The arts are those things we do to experience beauty in our lives—to derive fulfillment through creativity, to express ourselves in all our uniqueness, and finally to enhance the quality of our life. The arts help us to connect with our inner being, with all courses of study, and with the diversity of world cultures.

> Literature and the fine arts are of peculiar value because they represent appreciation at its best—a heightened realization of meaning through selection and concentration. But every subject at some phase in its development should possess, what is for the individual concerned with it, an aesthetic quality.
>
> *John Dewey (1966, 249)*

Every subject should possess an aesthetic quality.

We know the arts are more important today than ever before as we move into the technological complexity of the twenty-first century. Sensory and emotional experiences are major ingredients of the cognitive process. They cannot be separated. To be human, to be educated, students need the arts. Years of research show that the arts provide an important basis for optimal brain function at all stages of development.

How can we provide for these rich learning experiences in school? Children start school in prekindergarten or kindergarten as sensory, emotional, and rational beings. Throughout their young lives, they have learned through play and discovery how to maneuver and make sense of this world. Their world is and has been integrated. They imagined and created through dance, songs, movement, plays, drawings, paintings, sand castles, poetry, and stories. They discovered their world through sight, sounds, smells, taste, and touch. Science unfolded for them as they explored the beautiful world of insects, butterflies, fish, birds, water, flowers, and trees. They found the magic of stories by being read to, looking at picture books, and creating and telling their own stories. They've played ball, jumped rope, skipped, and played games.

Just as their world has been connected, our schools need to become integrated domains of knowledge and experiences. With this approach, we can create a learning environment in the school where they can continue to absorb, analyze, interpret, and understand the universe. In doing this, we are showing the connectivity of nature and information. When skills and information are fragmented, learning is not unified. We set up structures for learning that prohibit real understanding to take place. Given the immense amount of new, complex information we ask children to learn, it becomes frustrating and impossible to understand and process it all. Therefore, we need to connect.

How can we connect in meaningful ways? Different sources and forms of information can be connected so that students can attain a better understanding of themselves in relation to the world in which they live.

There are a variety of processes for learning in this manner. One process for learning is defined by Mihaly Csikzentmihalyi (1991) as he advances the idea of the optimal experience that defines the intense engagement of an artist in the process or act of creating. This opportunity for deep learning can be achieved by students as they seek answers to problems they are solving. They find that area of interest or tool for learning and then examine, discover, and create new meanings. Rather than being told what to do and just focusing on the answer, open-ended independent problem solving engages the student in inquiry and research to arrive at original answers.

Another process is based on the theory of multiple intelligences as proposed by Howard Gardner (1993a). Students come to us with many forms of intelligences: linguistic, mathematical and analytic, musical, spatial, bodily or kinesthetic, interpersonal, intrapersonal, and natural. Rather than using one style of instruction for all children, it behooves teachers to observe and document the learning style of each child. As the child processes and understands more clearly in and through his or her style of learning, all the other intelligences are reinforced and strengthened.

The creative processes of art, music, theater, dance, and writing, when used effectively, provide highly imaginative avenues for learning and discovery.

If indeed this is how children learn, then we need to reformat education so that the arts play a key role in the connective process. The creative processes of art, music, theater, dance, and writing, when used effectively, provide highly imaginative avenues for learning and discovery. To express oneself creatively, relationships become apparent, and things are no longer learned in isolation. Deep and lasting meanings occur; no longer is there a struggle to make things understood. The arts are tools for learning. Not only do they enrich instruction, but they also make learning more enjoyable and creative.

The arts provide a rich history of creativity and expression with all world cultures. The arts ask us to search for and to create meaning. The arts ask us to develop, explore, and communicate to the depth of our imagination to make sense of the world in which we live. The arts provide a multitude of possibilities for discovering and understanding all forms of information and communicating that information to the world. The arts provide ideas for understanding.

With this in mind, the arts as representatives of thought and the creative process can be scientific, mathematical or linguistic. They play a major role in defining and creating mental, visual, musical, and physical images. They provide processes for understanding in all areas of the curriculum and for all styles of learning. They are the natural connectors.

The arts require hard work, and it takes commitment to understand and create affective responses. The arts are important to understanding one's emotional and expressive being. This is particularly important for the young people in our culture who are disenchanted with school and their own lives and have little self-esteem and self-respect to allow them to find their place in society. By using the arts to build bridges, these individuals can see connections between their own lives and school activities as well as the meaning and purpose of learning.

How is this possible in a connected curriculum? Constructing learning environments based upon strong content components in each discipline, including the arts, is a necessary process. As each discipline content area is understood, this information should be expanded to include in-depth investigation in a unit of study or theme that is relevant to the curricular study. For example, if the unit of study is World War II, a connected unit of study might include the following: the economic, social, religious, and political condition of the countries involved; the horrors imposed on the Jewish population; the impact on and response of the arts and literature to the war; and technological and scientific events of this period. A three- or four-week study period may be necessary to acquire an in-depth understanding of this important era and include various curricular areas and teachers of these disciplines. This unit of study would culminate in some type of product or products—a theatrical performance, multimedia production, visual documentation, or other creative endeavor. This is the power of the arts when connecting—to go beyond the written and spoken word to engage students in expressing their new meaning of World War II—to provide substantive learning experiences for students.

Similarly, students may look at the aesthetics and persuasive powers of movies and commercials. What kind of contribution can a movie or a still image make to understanding complex events? What place do images and sound have in the public relations departments of major corporations? How do politicians use image and sound to their advantage? And last but not least, what impact do the arts have on our emotional and physical well-being?

The arts are the catalyst for rich connected lessons and student success in our schools.

As we engage students in the connected curriculum, we will be able to move them through an educational process in which the arts are partners with other academic areas of study and provide that rich basis for understanding in and through the creative process. Not only will students learn more deeply, but they will also be able to express themselves in ways that are possible only through the arts. Powerful learning experiences are best orchestrated when students enjoy and become deeply engaged in the process. The arts are the catalyst for rich connected lessons and student success in our schools.

REFLECTIONS

- What role do the arts play in your school? Are there projects in academic subject areas that require bringing in the art teacher?
- What can you do to include the aesthetic domain in your classroom?
- Can you think of personal experiences where a piece of music or art deeply affected you?
- Could we design schools and communities with more attention to beauty? Would that change how we go about our business?

9

Making Connections through Writing

Writing is a way of knowing and connecting, not just a tool for communication. The following section discusses how writing can be used to express personal experience helps students to reflect and learn about themselves.

> *Consolation. That was the word. I sat in the sweet summer night listening to my father sing about giving "consolation" and I imagined what this wonderful stuff might be. I was grappling with words to make sense of my father's song. I was struggling to connect my world with his.*
>
> *Trygve Danielson*

> ***Nothing is seen until the writer names it. Language permits us to see. Without the word we are all blind.***
>
> —Carlos Fuentes

And so it is with all of us. In our singular quest to construct meaning from our experience, we all rely on our most basic human attribute, our ability to use language. It is the very essence of connectedness. The way we manipulate language defines our relationship with all other things. As a result, writing, the manipulation of words in textual form, is an essential part of every child's education. Writing is at the center of learning (please refer to *Planning Curriculum in English Language Arts* [Wisconsin Department of Public Instruction 2001] for in-depth discussions of writing).

We can't keep children from writing. Give kids pencil and paper, and they will fill the page with words and images. They will pore over notes to friends and acquaintances. They will record the lyrics of entire CDs. They will spend hours conversing by E-mail to strangers. Why? What is it that propels them to put words in text form? They are experiencing the primal need to express themselves, to let others know they exist. And although it is important for them to learn to use writing in a transactional way to get things done—research reports, contracts, editorials, position papers, essays, and so on—it is more important for them to learn, especially at the beginning, that writing is also self-revelation. Writing can help our children reflect on and construct meaning from the hurricane of images and information that swirls around them.

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The Journey In

Any attempt to discuss connections is also an attempt to define which ones are essential—which ideas come together to make the most sense. The physicist searches for the single unified theory that simply and elegantly explains the universe. The physician seeks the single cause that underlies most diseases. Each of us in our own way struggles to find the essential connections in our own lives in an attempt to answer the basic question: How can I make my life meaningful and satisfying? In fact, isn't the essential purpose of school, at least in theory, to help kids answer that question? If it is, writing becomes almost irreplaceable in helping our children make connections in search of a meaningful and satisfying life.

Writing is a way for children to create meaning in their own words. When children are given the chance to reflect on an experience in writing, we permit them to clarify their personal understanding. The following composition, submitted by a Janesville student several years ago, clearly illustrates how a student can connect meaning using writing. The text uses the exact spelling because this student was both learning disabled and a reluctant writer.

> Music is a tool to pull out feelings. Fast Music usaly makes a person happy or energetic. Slow music usaly makes a person sad, weak or close.
>
> For instance, I remember when my grandma past away. All my relatives where at the visitation. Then the organ player started to play a very slow sad song. My father asked me to walk up to visit grandma with him. I knew I wouldn't cry because I bearly knew her. But the long notes were like onions under my eyes. I wasn't sad I just felt empty. It was like the music was pulling out my insides. I looked at my dad. I realized I hardly knew him either. But I didn't care at this time because the music was eckoing through my mined like howling in a vacante canion. With every step it became scarier and scarior. I clenched my father's hand like it would be the last time I would hold it. Wondering if he had the same thoughts as I had. Wondering if the soft meloudy was staking at this back, like it was mine. I stoped in confusion and looked at him. Sudenly a tiny tear sliced from his eye, roling down his old wethered face like it was a sign saying it was all right for me to cry. So I did. Not because of the loose of a relative but because some thing inside me wanted to walk over and detach the well dressed man's fingers that were pressing on the organ keies. Even thow he made me feel like I had never felt befor.

This composition uses several writing techniques successfully, but what is most significant is the insight this reflection brings to the relationship of father and child. This writer knows something new as a result of writing.

Although expressive writing is not unusual in many schools its value is often dismissed because it is not considered rigorous enough. But expressive writing helps create connections and provides students with the motivation to keep writing.

In this guide we argue that the arts can bring deeper understanding to other subject areas. Poetry might well fit into such a unit of study as illustrated by Donald Murray's poem "The Swords Survive" (Murray 1991), which shows how writing can connect on several levels.

THE SWORDS SURVIVE

In the Museum at Thessaloniki
the guide's voice fades, echoes
from another room. I stand

before a glass case; metal beaten
into armor that did not protect,
tiny swords once warm with blood.

Small men commanded from village,
forced to wear breastplate, plumed
helmet, spent their last night

sleepless on cold stones before
rising with the red sun to attack
other village men who had stranger

gods, served an alien king. I do not
know their cause but remember how our
blood cries, how young our legs

felt as we ran toward the enemy.
In this glass case are their remains:
swords bent with use, one dented

shield. This old soldier stands
at attention, in angry tribute
to men like him who were eager

to leave home, willing to believe
in a cause, until the sword missed
bone, drove to another's soft heart.

He feels the ease of giving death
in his own hand, hears his own warrior
cry, witnesses their sudden death.

The poem connects the past to the present, the concrete to the abstract, one old soldier to all the old soldiers. But more significantly, it also permits the poet to reflect on his own understanding of himself. The rich imagery—

Donald M. Murray, "The Swords Survive," in "One Writer's Curriculum," *English Journal* 80 (April 1991): 16–20. Copyright © 1991 by the National Council of Teachers of English. Reprinted with permission.

"Sleepless on cold stones"—creates a tactile experience for both writer and reader. And so it is with all forms of expressive writing. The novelist, the playwright, the lyricist, and the poet all discover truths about themselves in their writing. All who write can do the same.

New Roles

Up to this point our purpose has been to illustrate the key role that writing plays in helping students make connections in schools. We have focused on the process of writing without discussing instructional methods. It is important, however, that teachers recognize the new role they must play in the connected classroom. Writing is not content specific; it never has been. But a student-centered and process-oriented curriculum will require teachers to change fundamentally the way in which they work. Teachers will be expected to know that writing is expressive, not just expository. They will be expected to know that writing is a way of knowing, not just a tool for communication. They will be expected to know that writing is recursive rather than linear. Classroom teachers will need to use writing in a new way to assist children in the quest to construct meaning in school.

We must permit teachers to rediscover what little children still know: Good writing starts with passion and desire.

In order to play this new role, teachers will be asked to reflect on their own writing experiences and discover new ways to use writing in the classroom. This process is necessary to dispel the notion that writing is some mysterious gift that only special people possess or that the best examples of writing come from the academic world. We must permit teachers to rediscover what little children still know: Good writing starts with passion and desire. As Robert Frost said, "No tears in the writer, no tears in the reader." Teachers must understand the writing process to avoid creating students who automatically view themselves as inadequate writers. Of course, students still have to understand the conventions of quality writing, such as correct spelling, appropriate word use, and proper grammar. But in our zeal to produce mechanically correct writing, we have created a majority who believe they can't write. Worse, we have fostered the notion that if writing is mechanically correct, it must be high quality. If teachers fully understand the writing process, they will know what types of writing experiences will be most beneficial for their students, and they will know what level of quality to expect. As in any area, some students will write better than others. Our job is to keep everybody writing.

The Russian Jewish poet Isaac Babel once said, "No steel can pierce the human heart so chillingly as a period at the right moment." Writing permits our children to seek connectedness in everything they do. It also gives them a power to control their own learning by permitting them to manipulate words for various reasons. The communication skills—reading, writing, speaking, and listening—are the central means by which students make connections between the outside world and themselves. Let us help our children make connections that bring them harmony. The fox says in Antoine de Saint Exupéry's *The Little Prince*, "What is essential is invisible to the eye" (1982). Let us be certain we help our children learn the essential connections through writing.

When I Write

By Claire Hierseman, fourth grade, Cushing Elementary
School, School District of Kettle Moraine, 2001

When I write I am transferred to another world,
a world where there is a river flowing with ideas
and the earth is made of imagination.
The roots of the trees are my beginning thoughts.
Sap surges through the pulp
like my ink spreads across my paper.
Tender leaves turn green as my words get clear.
Leaves that hang over my head
are all the final drafts of my perfected writing.
The full grown tree shimmers in the sunlight
just like I shine with joy when I present my piece.

REFLECTION

- ☐ Has writing played the role described in this section in your life? Have you seen students use writing as a tool to get to know themselves?
- ☐ How can you infuse writing in your curriculum?

Best Practice Profile

Kids Writing for Kids

Title: Kids Writing for Kids

Source: Diane McCarty, Malcolm Price Lab School, Cedar Falls, Iowa

Related State Standards

Informational Technology Literacy: A.4.3 Use a computer to organize and create information.

Social Studies: E.4.5 Identify and describe institutions and their contributions to the well-being of the community, state, and nation.

English Language Arts: B.4.2 Plan, revise, edit, and publish clear and effective writing.

Family and Consumer Education: A.4.3 Identify a variety of resources, individuals and families used for addressing concerns of a family.

Concepts: Community, interdependence, advocacy, communication

Connecting Elements

- Personal relevance
- Real-life application
- Interdisciplinary planning

Diane McCarty, a fourth grade teacher at Malcolm Price Lab School at the University of Northern Iowa, came to the realization that the old and the familiar can come alive through the eyes of young and eager learners. "That's exactly what happened," she says, when her students made the "ordinary seem extraordinary" while working on a hometown project. The focus of their endeavor was a profile of Cedar Falls, Iowa. Their collective purpose was to sell their community to other children throughout the state and nation. The target audience was kids: "kids of parents who were thinking about making Cedar Falls their home; kids of executives who might be coming to town; kids in motel rooms in town spending the night."

Put simply … it was kids working for kids.

What emerged was a highly effective instructional strategy that can and has been adapted in Wisconsin schools to offer a "kid's eye view" of where Wisconsin children live, play, love, and learn. Diane McCarty's approach is exemplary not only for its vision but also for its straightforward simplicity and appeal to common sense. What better way to make writing meaningful and exciting than by having students persuade their peers to also experience the charm, history, and wonder of a place they call home?

The medium for that persuasion is a community brochure. Colorful, upbeat, and informative, the publication unfolds into a poster that describes everything kids might want to see and do on a Cedar Falls tour. A measure of its success is that "A Kid's Eye View of Our Hometown" is available at local banks, real estate offices, and in chambers of commerce throughout Iowa.

McCarty's first step in making the project a reality was to seek financial support from the Iowa Chamber of Commerce and Department of Tourism. Money was needed to produce a quality finished product. Her appeal rested on the assumption that her students writing for other students would have a

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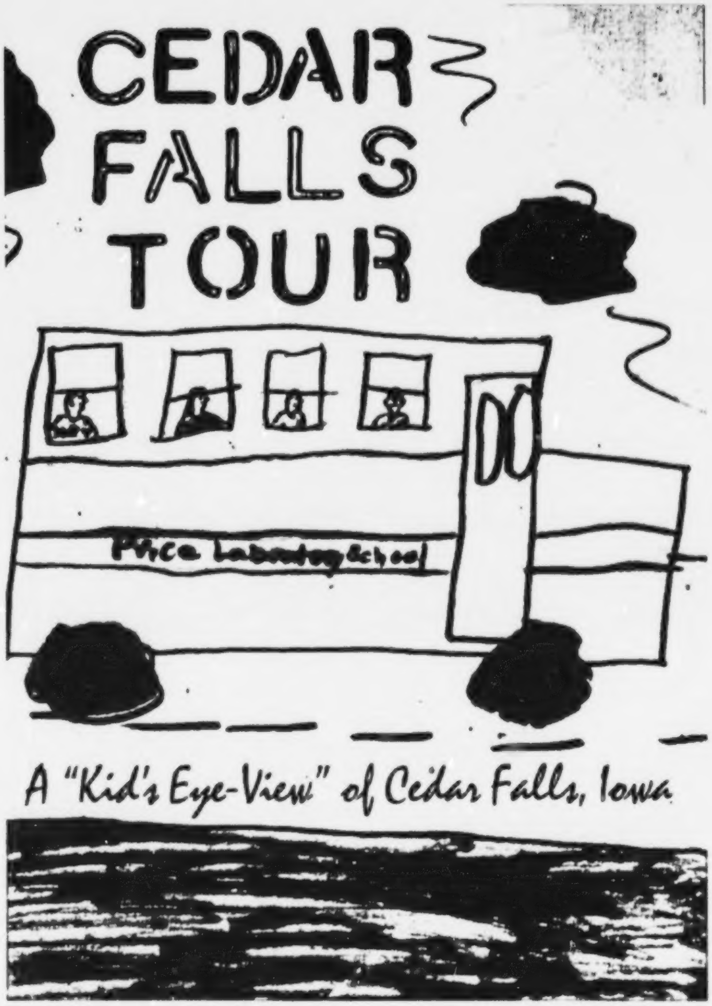

fresh, novel outlook on their community. The strategy worked. She got $500 of working capital.

After brainstorming a list of places in town that might be of interest to others their age, the students took a bus tour of Cedar Falls. Arranged and funded by the local chamber of commerce, the 90-minute familiarization field study provided needed background and information. McCarty, in reflecting on the tour, calls it "the best thing to do to excite them about the project." The tour placed the learning expectations within context. The students had a *purpose* when they were looking at their hometown. "After all," McCarty notes, "they would be writing about some of these places" that included the Ice House Museum, a historical restaurant, and original buildings on Main Street.

In the interim, the state Department of Tourism found a printer that wanted to support the initiative by donating its time and expertise to print 5,000 copies of the brochure. The hard work was ready to begin.

First the list of places that pupils wanted to write about was pared from 85 items to 20. This was accomplished through a student vote. Two writing

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teams were identified. One smaller group made up the historian team, while the rest of the students were paired to write about current places of interest and events. To provide an additional frame of reference, McCarty read aloud an article from a Wyoming magazine on a similar project. The students discussed what they liked best about the narrative and what could be gleaned to add zest to their brochure. Time was also allotted for the classroom authorship of a "local library rap" that the students liked so much that they kept it in the final product.

Over the next two weeks, writing teams used available computers to write their articles. Forty-five minutes each day was allotted to this reading–writing–social studies project. Articles touched on such topics as outdoor fun, the visual arts, local history, crafts, and a survey of "great places to eat for young children." Also included were pencil illustrations drawn by the students to enhance the meaning of their articles.

After the articles were downloaded, they were proofread and edited. The fourth grade arranged the stories into a preliminary layout where they were checked for accuracy. With the help of a graphic artist, McCarty decided on the final format, which included special paper to make the illustrations look more authentic.

As a part of a culminating celebration, the students and their parents were invited to the printing plant to see their brochure being created. Included in this information experience were chances to observe the operation of computer software and scanners in the production process and the various steps necessary to complete the project. The students also heard about career opportunities in printing.

After the brochures dried, each student was given a copy to take home. McCarty immediately had a sustained silent reading time that was enriched by a congratulatory cake from the chamber of commerce.

Reactions over the last several years have been highly positive. Professors at the University of Northern Iowa have included it in their recruitment packet, while realtors think it is a great idea. Local banks give it as a gift to new accounts. Cedar Falls's businesses appreciate the new advertising, and *every* chamber of commerce in the state has received a copy for its review and possible emulation.

Since Diane McCarty's idea was first published (McCarty 1994), many Wisconsin teachers have embraced the concept with the following modifications:

- On-line applications have become more numerous. Computer graphics have replaced pencil drawings. Research might include a bus tour but also access to a Web site. Information is filtered through the eyes of a child but is also obtained through their fingers on a keyboard.
- Kids Writing for Kids is a recognized framework for teaching different types of writing. Narrative, persuasive, expository, and descriptive writings are all possible and appropriate in addressing a target audience that mirrors who you are.
- The community brochure format has increasingly been used to enhance student-to-student learning. Fourth grade students studying

Wisconsin history assume the role of "historians" and author a history of their locality—for use by third grade students studying the heritage of their community.

- Community profiles increasingly have become the basis for interstate and nationwide classroom dialogue. It was not uncommon several years ago to exchange postcards between an elementary school in Wyoming with a classroom in DePere. Technology has now made that exchange quicker and deeper in meaning, application, and purpose.
- Models such as Kids Writing for Kids demonstrate the mutual benefits associated with community partnerships. With this strategy, community leaders are included as vital participants in a learning process that utilizes their perspectives and expertise. We need and must value that contribution.

Making Connections across Science, Technology, and Society

10

Science and technology have significant impact on society. This chapter suggests ways in which science, technology, and society connections improve teaching and learning and how state standards make these connections possible.

The development of academic content and performance standards and the ongoing process of forming meaningful assessments of student learning speaks loudly in favor of connecting the curriculum in a variety of ways. One good example of connecting science and social studies is evident in the teaching of David Wentworth at Waukesha West High School. David developed a series of lessons that challenge students to think about the impact of science and technology in their lives, their own homes, and the larger community. Moreover, he connects history with science through lessons on the influence of chemistry in the conduct of warfare, which he presents in both science and history classes. He uses the arms race between Germany and Britain leading up to World War I as the historical context for the development of poison gas. In addition, he challenges students to think of the implications of Zyklon B, the deadly chemical designed specifically by highly educated scientists for the mass murder of concentration camp inmates under the Third Reich.

The state model academic standards offer strong support for a connected approach to teaching and learning.

Science, Technology, Society, and the State Standards

The preceding teaching example demonstrates the connectedness of knowledge and the possibilities available through a connected curriculum. Although connections exist in the real world, too often the curriculum fails to challenge students to think about the connections and the implications for their own lives and their role as citizens. The state model academic standards offer strong support for a connected approach to teaching and learning. Note, for example, how the following academic standards cut across social studies and science. Each of these crossover points connect to citizenship education and the ability of individuals to make sound and informed decisions in science, social studies, mathematics, and language arts.

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Fourth Grade

B.4.8 Compare past and present technologies related to energy, transportation, and communications, and describe the effects of technological change, either beneficial or harmful, on people and environment. (Social Studies—Time, Continuity, and Change)

C.4.1 Distinguish between fact and opinion and provide evidence to support opinions. (English Language Arts—Oral Language)

E.4.8 Illustrate resources humans use in mining, forestry, farming, and manufacturing in Wisconsin and elsewhere in the world. (Science—Earth and Space Science)

H.4.4 Develop a list of issues that citizens must make decisions about and describe a strategy for becoming informed about the science behind these issues. (Science—Social and Personal Perspectives)

Eighth Grade

B.8.8 Identify major scientific discoveries and technological innovations and describe their social and economic effects on society. (Social Studies—Time, Continuity, and Change)

B.8.9 Explain the need for laws and policies to regulate science and technology. (Social Studies—Time, Continuity, and Change)

C.8.2 Evaluate the reliability of information in a communication, using criteria based on prior knowledge of the speaker, the topic, and the context and on analysis of logic, evidence, propaganda, and language. (English Language Arts—Oral Language)

E.8.4 Use the results of data to make predictions, develop convincing arguments, and draw conclusions. (Mathematics—Statistics and Probability)

E.8.6 Describe through investigations the use of the earth's resources by humans in both past and current cultures, particularly how changes in the resources used for the past 100 years are the basis for efforts to conserve and recycle renewable and non-renewable resources. (Science—Earth and Space Science)

E.8.3 Understand the consequences of decisions affecting personal health and safety. (Science—Social and Personal Perspectives)

Twelfth Grade

A.12.10 Analyze the effect of cultural ethics and values in various parts of the world on scientific and technological development. (Social Studies—People, Places, and Environments)

A.12.11 Describe scientific and technological development in various regions of the world and analyze ways in which development affects environment and culture. (Social Studies—People, Places, and Environments)

C.12.1 Synthesize and present results of research projects, accurately summarizing and illustrating the main ideas, using appropriate technological aids, and offering support for conclusions. (English Language Arts—Oral Language)

E.12.4 Analyze, evaluate, and critique the methods and conclusions of statistical experiments reported in journals, magazines, news media, and advertising. (Mathematics—Statistics and Probability)

E.12.7 Use scientific methods to assess the influence of media on people's behavior and decisions. (Social Studies—Individuals, Institutions, and Society)

G.12.3 Analyze the costs, benefits, or problems resulting from a scientific or technological innovation, including implications for the individual and the community. (Science—Science Applications)

H.12.3 Show how policy decisions in science depend on many factors, including social values, ethics, beliefs, time-frames, and considerations of science and technology. (Science—Social and Personal Perspectives)

The connections are further extended through the standards for information and technology literacy. In a discussion over the meaning of the learning community, the standards point to the "use of information, media and technology in a responsible manner" (D.4.2, D.8.2, D.12.2). Standards on information and inquiry emphasize the importance of not only developing skills and understandings about how to access information but also of experience in evaluating information for bias, misrepresentation, and reliability of sources. Distinguishing between fact and opinion, a basic element of critical thinking and the weighing of evidence, cuts across all three levels and connects with standards relating to propaganda from oral language, science, and social studies (B.4.4, B.8.4, B.12.4). The connectedness is already imbedded in the standards. How do we translate these standards into a dynamic and meaningful curriculum?

There is an essential context to this question. The transformation of our sense of community wrought by the Internet alone challenges educators in new and difficult ways. Indications are that students will remain part of a cyberspace community marked by an ever-increasing volume of information in a marketplace peddling not only consumable goods but also ideas. How can the connected curriculum prepare students to interpret this dizzying array of information, much of it laced with propaganda and made possible by profound technological change? To even begin addressing this question demands a new conception of knowledge. Renate and Geoffrey Caine (1994, 7) observe that "most schools do not engage students in the reflection, inquiry, and critical thinking needed to help them cope with and take charge of the influences of technology and media." As a result, many students are members of a generation which "has access to a great deal of superficial information, but had no deeper sense of how that information connects to ecological issues, a global economy, the quality of life, or even the joy of learning" (7).

The significance of the standards is that there really isn't a wall between the disciplines but a kind of seamless web of ideas.

The significance of the standards is that there really isn't a wall between the disciplines but a kind of seamless web of ideas. The model academic standards for Wisconsin presented earlier reflect a strong potential for the development of a connected curriculum. A prerequisite for this instructional orientation demands a significant change in not only what we teach but also how we teach. One connected model of teaching and curriculum development places the interrelationship of science, technology, and society at its center.

The public policy issues confronting citizens are numerous and complex; many of them have significant scientific or technological components with strong implications for society as a whole. Designing new science, technology, and society (STS) curriculum invariably places teachers and their students in touch with a broad range of real-world problems. Because science and social studies teachers, like all other curriculum writers, live in a world of economic scarcity reflected in both time and money, they might begin the process by considering the importance of 12 common STS public policy issues to their and their students' communities (National Council for the Social Studies 1990). (See Figure 10.1).

Rank the following 12 issues on a scale of most important (1) to least important (12). Begin by ranking those items you think are most important (i.e., 1, 2, 3, 4). Then rank the least important (i.e., 9, 10, 11, 12). Finally, rank the middle options from most to least important (i.e., 5, 6, 7, 8).

________ Air quality and atmosphere (acid rain, carbon dioxide, depletion of ozone, global warming)

________ Energy shortages (synthetic fuels, solar power, fossil fuels, conservation, oil production)

________ Extinction of plants and animals (reducing genetic diversity)

________ Hazardous substances (waste dumps, toxic chemicals, lead paints)

________ Human health and disease (infectious and noninfectious diseases, stress, diet and nutrition, exercise, mental health)

________ Land use (soil erosion, reclamation, urban development, wildlife habitat loss, deforestation, desertification)

________ Mineral resources (nonfuel minerals, metallic and nonmetallic minerals, mining, technology, low-grade deposits, recycling, reuse)

________ Nuclear reactors (nuclear waste management, breeder reactors, cost of construction, safety)

________ Population growth (world population, immigration, carrying capacity, foresight capability)

________ War technology (nerve gas, nuclear development, nuclear arms threat)

________ Water resources (waste disposal, estuaries, supply, distribution, ground water contamination, fertilizer contamination)

________ World hunger and food resources (food production, agriculture, cropland conservation)

________ Genetic engineering (cloning animals)

The following questions are designed for a follow-up discussion with colleagues:

- How much do you know about each of the twelve STS issues?
- How important is it to study these issues as part of science and social studies courses in middle school or high school?
- How do you think each of these science-related problems will change by the year 2020?
- What does your response to these questions mean to you as a citizen?
- What are the implications of your responses for the science and social studies curriculum you will teach?

FIGURE 10.1 **Curriculum Priorities for Science- and Technology-Related Social Issues**

The STS Model and Connected Learning

One of the underlying assumptions of the STS model is that science and technology do not exist in a vacuum. Profound social, political, and economic implications are evident through advances in scientific knowledge and technological change, a reality that has been reconfirmed many times over in history. Albert Einstein offered one of the most challenging observations on this relationship shortly after the first test of the atomic bomb in the desert of New Mexico in 1945. He said that the atomic bomb changed everything except the way we think. Einstein's insight symbolizes the inherent connections between science, technology, and the human values that shape them. The STS model, developed by Wisconsin science educators in 1986 and further refined by Oravec (1990), is still as applicable to connected learning today as it was in previous years. Here again is a humbling reminder that curriculum ideas of a connected nature are not necessarily new.

Science and technology do not exist in a vacuum.

The STS model emphasizes the interaction of science, technology, and society (Figure 10.2). Like intermeshing gears, science and technology are interrelated with politics, economics, attitudes and beliefs, and both societal and personal needs. The STS model lends itself well to the integration of case studies, site-specific examples, and problems as illustrated in the following scenario.

As part of a large unit of study on waste management, students came to a classroom one day completely surprised by collections of filled garbage bags placed around the room. They were instructed to pretend they were garbologists living in the year 2500 and were asked to examine the contents of this "dump site." Their task was to catalogue all pieces of solid waste and then organize cultural categories emerging from the artifacts. From this process, students drew tentative conclusions about the beliefs and values of the culture that produced the garbage. Moreover, the groups also considered the role that sci-

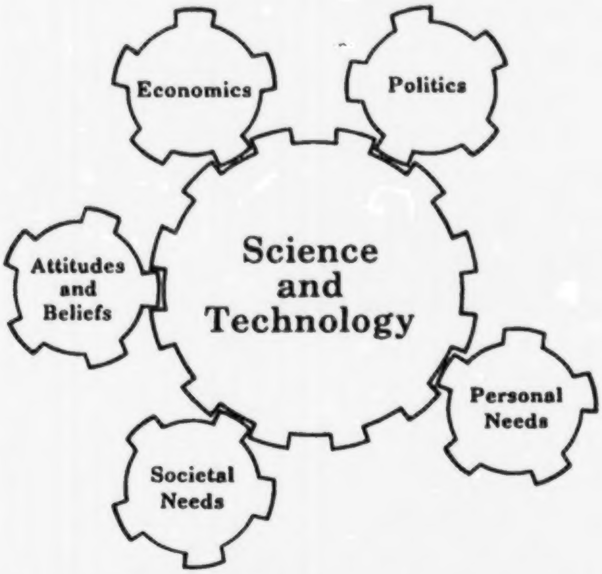

FIGURE 10.2 **Interaction of Science, Technology, and Society**

entific knowledge and technology played in both the creation of the waste (e.g., plastics) and its disposal. (Food waste and soiled diapers were not included in the collection, and students wore plastic gloves). This foray into anthropology preceded a field trip to a local recycling plant where students investigated the STS relationships with waste management. Among the concerns was the influence of economics concepts such as scarcity and incentives. A decision-making model weighting costs and benefits was applied regarding whether to build a landfill adjacent to the community of Gladville through the simulated town hall meeting, "Where Does All of the Garbage Go?" created by Richard Brouillard. Various political and economic interests were represented in spirited debates.

Students engage in a host of issues and problems that are part of their world.

A hallmark of STS modeling is that students engage in a host of issues and problems that are part of their world. At the same time, as the model academic standards suggest, thorough content preparation remains critical if students are able to make informed and meaningful connections between and among various kinds of knowledge. What STS suggests is that we provide a meaningful context for student learning so that the content knowledge remains connected rather than isolated and unrelated. Active and informed democratic citizenship, long an avowed value of education, can not become part of students' life unless they gain practice and experience in democratic processes. STS can provide one of the doorways into this process.

Curriculum Case Studies and Connections between the Disciplines

One of the best collections of STS lesson plans and curriculum materials resulted from the creative efforts of the Social Science Education Consortium, edited by Robert LaRue (1988). Although somewhat dated, this curriculum reflects a connected view of knowledge for science and social studies teachers that deserves close examination. A number of curriculum examples from this large collection are offered here to demonstrate authentic ways in which various content disciplines might connect through science and technology.

The Technology Tree

The Technology Tree provides a fascinating way of examining how various "stem" technologies intertwine with related "branch" technologies. (See Figure 10.3). The connections are extended to people-oriented social systems. Not the least of the features in this technology tree are the changes in society resulting from the development of the stem technology. Providing an initial context for this exploration are the words of Victor Ferkiss, which speak to the essential interrelationships between and among technological systems and social contexts. LaRue (1988) suggested that students provide examples supporting their own agreement or disagreement with each of Ferkiss's statements. The example of the automobile as stem technology provides another context for the lesson before students embark on the development of technology trees based on their own choices of stem technologies. The following questions are suggested for discussion of technology trees presented by students:

No technology exists in isolation.
Individual technologies are part of technological systems.
Technological systems exist in social contexts.
Technological systems modify the societies in which they exist.
—Victor Ferkiss

Directions: Fill in the first blank on the left with an existing technology. In the colum headed "Technological System," fill in branch technologies that are intertwined with the stem techology. "Social Systems" are people-oriented systems that are interwoven with the stem and branch technologies. Finally, list at least 10 changes in society that resulted from the development of the stem technology.

Stem	**Branch**		**Fruit**
Technology	Technological System	Social System	Changes Resulting from the Technology
Automobile	Metal/alloy production	Driver licensing	Drunk driving deaths
	Plastics	Advertising	Family conflict over car use
	Petroleum	Parking spaces	Live farther from work
	Repair networks	Insurance systems	Easy movement of goods
	Rubber production	Road route	Travel farther for vacations
	Paint technologies	Selection process pollution	Hectic pace of life
	Glass	Effects/control Safety	Mass transportation in pear shape
	Electronics	Delivery networks	Health risks higher due to pollution
	Textiles	Financing systems	Greater privacy
	Radio engineering	Physical communications	High employment while the industry grew

Source: adapted from LaRue 1988.

FIGURE 10.3 **Sample Technology Tree**

- How would we categorize the technologies selected by the students?
- How many revolve around information technologies?
- What evidence shows that this is an area of increasing concern in our society?
- How can seeing connections help us understand new technologies?
- How can examining the connections between science, technology, and society today help us in the future? (LaRue 1988, 21–22).

The choices for stem technologies and the technology tree are, of course, part of a broad universe. Students could focus on the present time frame with examples such as computers, aspirin, commercial jet aircraft, television, the Internet, and cell phones, to name just a few. A more extensive perspective on the history of science and technology is also a possibility with this approach. An even greater challenge is to tap stem technologies from a more distant past and articulate related social and technological systems and resulting changes within a historical framework. The electric light, gunpowder, the steam engine, the cotton gin, and the Gatling gun are some possibilities.

Science and Technology in the Media

As LaRue (1988) points out, most of us gain information about science and technology through the popular media. Since the initial appearance of this curriculum collection, the Internet has transformed the marketplace and our sense of community. The Internet now is one of the major pipelines to the news media for millions of Americans. Television, news magazines, and newspapers are still important parts of this media mix, but they, too, are being transformed by immediate access to on-line information. Analyzing information about science and technology from media sources connects to a number of the social studies, science, information and technology literacy, language arts, and mathematics academic standards mentioned earlier. As students use the Internet for research, they will have to weigh a variety of claims and counterclaims.

Some will be supported by statistical data, anecdotal evidence, and testimonies. Bringing students to look more closely at how the media treats issues of science and technology can be a good place to start. Being media savvy does not simply mean the ability to access information; here it implies another more critical quality of even greater importance to civic life in a democracy. Besides accessing information, students need to apply those elements of critical thinking that help them make informed decisions, some of which will hinge around issues such as land use, cloning, pollution, and nuclear energy.

The following suggestions for an analysis of news media are built around the investigative activities of several groups. One group could center on the frequency and nature of science and technology issues found in newspapers, while another could examine television news and yet another, weekly news magazines. Each group can designate responsibilities so that each individual follows one network, newspaper, or magazine. An alternative is to conduct the entire process using the Internet because all major media sources now offer news through this medium. Defining the time frame is critical so that students

Use this form to record the amount of attention devoted to issues related to science and technology by ______________________________ during the period ______________________________.

Publication or broadcast date	% of time/space devoted to science/technology	Science/technology issues covered	Was coverage positive, negative, or balanced?	Was the effect of science and technology on society covered?

FIGURE 10.4 **News Media Analysis Form**

can examine coverage over a specified period of time. Figure 10.4 provides a framework for the investigation. In addition to recording the publication or broadcast date, students estimate the percentage of coverage dedicated to science and technology and articulate the STS issues addressed. Students should indicate whether the media coverage was positive, negative, or balanced in nature. Finally, students comment on the degree to which the media addressed the effects of science and technology on society. The findings can be used for a subsequent discussion comparing and contrasting media sources and their coverage of STS issues. As a culminating activity, student groups are urged to write letters to editors of various media suggesting improvements in the coverage of science and technology issues as well as communicating concerns associated with the balance and depth of coverage.

Computers and the Internet: The Transformation of Culture

The activity "The Transformation of Culture" links writing and research with one of the most dynamic STS topics touching the lives of students. Some of the most immediate STS questions raised in schools are ones intimately tied to the relationship between students and technology:

- How would your life change if we did not have the Internet?
- How are new computer applications or communications technologies transforming our culture?
- What relationships can you draw between computer technology and parts of the STS model (economics, politics, social needs, personal needs, attitudes and beliefs)?

Taking the discussion a step further, students could form research groups to investigate the impact of the Internet technology on the following cultural developments:

- Access to information
- Investments and the stock market
- Privacy issues
- Consumer buying behavior and the marketplace
- Freedom of speech
- Positives versus negatives of the Internet

Student research writing could integrate computer-generated poster sessions and artwork to reinforce student learning in regard to these public policy issues. E-mail discussion groups might also form bulletin boards for research members to share ideas.

The History of Science

Developing a stronger historical perspective on STS issues is one of the hallmarks of a connected STS curriculum. National History Day (NHD), a program that brings middle school and high school students into actively researching history through primary and secondary sources, recently sponsored student research work centered around the theme of science, technology, and invention in history. Students could choose any of four categories including performance, historical papers, documentaries, or historical exhibits, each of which required an annotated research bibliography to share their research. The NHD theme booklet, a treasure of STS research ideas on the history of science and technology, can be accessed via the NHD Web site at http://NationalHistoryDay.org.

The following topics, only a few among over seventy in number, came out of the NHD theme booklet for teachers and students (National History Day 1999, 10–11).

- Germ theory and its consequences for public health
- Scientists who made discoveries about local geology, animals, and plants in your area
- The plastics revolution
- The barbed wire fence: its role in the economy and the culture of the American West
- Evidence of a culture's knowledge of math: architectural design, games, trade activities

- Technology and twentieth-century change in war: the tank, poison gas, the machine gun
- Indoor plumbing and its impact on women's work
- The Chernobyl accident and its social, environmental, and economic impact
- Interchangeable parts and their impact on industry
- History of the role of a technology in the life of your community
- The discovery of acid rain
- Inventors who never got credit for their work
- Nineteenth-century medical views of women

Critical to the assessment of this kind of STS research project on the history of science and technology is the student development of historical perspective on the topic as well as its significance in history. Moreover, students need to show how the topic changed over time. In the words of the NHD theme booklet, "The theme is designed to engage students in questions about *why* scientific and technological developments emerged when they did and what *impact* they had, not only on the progress of science or technology, but on individuals and societies" (8).

Connecting Curriculum to the Internet: Selected STS Web Sites

Access Research Network

http://www.arn.org
(genetic engineering, euthanasia, fetal tissue research, AIDS, evolution versus creationism, computer technology, and environmental issues and their relationships to politics, ethics, and philosophy)

American Institute of Physics

http://www.aip.org

Centers for Disease Control and Prevention

http://www.cdc.gov

Explorium ExploraNet

http://www.exploratorium.edu

Faces of Science: African Americans in the Sciences

http://www.lib.edu/lib/chem/display/faces.html

History of Mathematics

http://www.matths.tcd.ie.pub.histMath

Impact of Technology on Society

http://www.techandsociety.homepage.com

Issues in Science and Technologies

http://www.nap.edu/issues

National Aeronautics and Space Administration (NASA)

http://www.nasa.gov

National Council for the Social Studies (NCSS)

http://www.ncss.org/linksviii.html

National History Day

http://www.NationalHistoryDay.org

National Space Society

http://www.nss.org

Nobel Prize Internet Archive

http://nobelprizes.com

Penn State University's STS Department

http://www.engr.psa.edu/sts

Science, Technology, and Society

http://www.personal.u-net.com/~nchadd

Smithsonian

http://www.siris.si.edu

Teaching about Evolution and the Nature of Science

http://www.nap.edu/readingroom/books/evolution98

Technology and Change

http://www.nsba.org/sbot/toolkit/tnc.html

Technology Survival Kit

http://www.alteich.com

Women-Related Science and Technology Web Sites

http://research.umbc.edu/~korenman/wmst/links-sci.html

11

Making Connections through Curriculum Design and Assessment for Meaningful Instruction

This section outlines the curriculum-planning process through guiding questions, essential understandings, and conceptual lenses. The message is clear: Students will be challenged intellectually if the curriculum is organized and connected around concepts. Assessment practices follow this premise. Even though the examples have been taken from the elementary grades, the described processes are just as valid for middle and high school.

Educators create many different organizing techniques for structuring connected or integrated lessons and units. Which design to use is up to personal preference, as long as that design incorporates three essential components. Lessons and units must be designed around

- Curriculum standards
- Strong conceptual organizers
- A plan for assessing student understanding

Guiding questions

In this section you will find a technique (and examples) for designing thoughtful connected units that begins with choosing guiding or essential questions. Those guiding questions help to ensure that curriculum connections are relevant and meaningful. An important organizing technique for designing connected curriculum is the development of a *guiding question* (Jacobs 1989, 1997) that is derived from a concept and creates a specific focus for a lesson or unit. In fact, when there is a strong guiding question—sometimes called an *essential question* (Erickson 1998)—connections come easily and flow naturally, providing the framework for meaningful instruction. Rob Traver (1998, 70) defines a guiding question as "the fundamental query that directs the search for understanding." It is a probing question that needs to be answered through research and investigation. It raises the level of student thinking by requiring the use of critical thinking and problem-solving skills. It also reminds teachers that conceptualization is more critical to student learning than merely gathering information.

Focus on standards

Frequently in lesson and unit design, insufficient attention has been directed toward creating an organizing center based on standards, with a clear focus on what students will learn and how that learning will be assessed. In-

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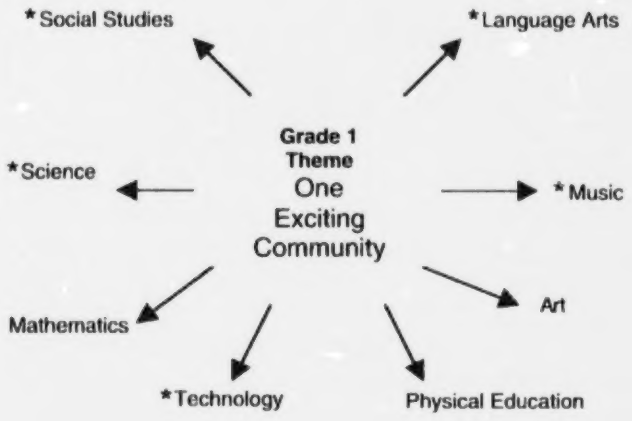
stead, first thoughts often turn to activity ideas that coordinate with each other and across disciplines. Without a guiding question to provide the focus in the connected unit of study, connections are often superficial and do not set the stage for deep understanding and better learning. Planning for a connected curriculum requires a holistic approach through the conceptual lens of essential questions. When teachers begin their lesson or unit with a guiding question, the focus is clear. They design a road map for themselves and the students that outlines the desired outcomes and establishes a direction for natural connections between concepts, within and across disciplines. The guiding question becomes a natural lead-in for the final assessment of student understanding.

A Model for Connected Learning: Selecting Themes, Conceptual Lenses, and Guiding Questions

Burleigh Elementary School uses a successful model that incorporates the ideas of Heidi Hayes Jacobs, Susan Kovalik, and Lynn Erickson. All units are designed around the School District of Elmbrook's standards. In this model, teachers

1. Decide on a theme for their connected or integrated unit.
2. Develop a web based on the standards around the selected theme (see Figure 11.1).
3. Examine the various disciplines, looking for connections within and across them.



This Curriculum Web allows teachers to brainstorm logical connections across disciplines when designing integrated units. The disciplines that are starred seemed to offer the best connections for the community theme.

FIGURE 11.1

A theme unifies

Through the brainstorming process they find that some disciplines offer natural connections within the theme, whereas other disciplines may not connect well at all. Those areas are not forced into the unit and will probably have to be taught separately.

First grade teachers selected the theme "One Exciting Community" for their yearlong unit. The theme of community was well grounded in the district social studies standards, as students are required to examine their school community and the role of workers within it. It also provided an umbrella for learning about the scientific concept of interdependence by studying the relationship among plants, environment, and weather. When teachers examined the curriculum standards in language arts, science, and technology, they found that these also had meaningful connections to the community theme. Other areas, such as mathematics, would be woven into the unit at times during the year when it made sense to do so but would not be principal parts of this unit. In fact, teachers realized a great connection to mathematics when they outlined the data collection activities that students would use to solve an environmental problem in the school community.

Concepts give focus

A concept is an organizing idea, a mental construct which is timeless, universal, abstract, and represented by one or two words.

Lynn Erickson (1998, 56)

Once the standards and disciplines had been chosen, the next step was to determine the conceptual lens that would create a focus for instruction and assessment. Concepts can come from many disciplines. According to Erickson (1998, 56), a concept is "an organizing idea, a mental construct which is timeless, universal, abstract and represented by one or two words." Selecting a concept can be a challenging task, but the end result is a thoughtful, well-planned unit that promotes thinking and deep understanding.

Here are just a few examples of concepts that cross disciplines:

Examples of concepts

beliefs
civilization
courage
cultures
discovery
ecology
expression
habitats
innovation
friendship
independence
justice
liberty
resources
survival

Erickson (1998) lists many more concepts that may help with curriculum planning.

Concepts, standards, and big ideas

When determining the appropriate concept, teachers should try several to see which one truly focuses on the standards and big ideas for the unit. In the early planning stages it may be a good idea to select no more than four concepts. After close examination of the unit's goals, one or two main concepts are selected that will ultimately direct teaching, learning, and assessment in the unit. In Burleigh's example, first grade teachers decided to focus on interdependence and respect as the concepts for their theme of community.

Theme: Community concepts—interdependence, respect

Steps

1. Choose themes to connect disciplines.
2. Select concepts.
3. Write guiding questions based on standards.

With the desired discipline connections made and the conceptual lenses selected, the next step is to write the guiding question, which should be based on curriculum standards and open ended enough to "challenge the thinking of students beyond the facts" (Erickson 1998, 94). Depending on the unit's length, the guiding questions can be broad or specific. Regardless of the scope, they provide the focus for the area of study. Guiding questions usually begin with words such as *how* and *why* to set the stage for investigation and high levels of thinking.

How?
Why?

Example from first grade:

How do people, animals, and the environment depend on each other?

Third grade teachers designed a unit around the organizing theme "The Interdependence of the World and Its People." Their concepts of regions and nature led to the following guiding question that connected several standards in language arts, social studies, and art.

Example from third grade:

"How did the relationship between people and nature differ based on their geographical regions?"

Determine assessment

Each of the guiding questions just presented shows how standards can come together in a relevant, meaningful way to direct connected learning experiences. With these questions, learning is more focused and purposeful. The connections within and across disciplines are natural, creating opportunities for students to probe for a true understanding of concepts. The guiding question not only provides the roadmap for integrated learning experiences but also becomes a direct link to the final unit assessment. Once the assessment is determined, it is time to begin the last step in unit design—developing activities that will help students reach the desired outcomes.

Conceptual lenses: Cultures, interdependence

Guiding question

Example: In a fourth grade unit on Wisconsin history, teachers wanted students to understand the influence that various cultures had on the growth of our state as well how Wisconsin settlers depended on friends and family. Using the concepts of cultures and interdependence within the theme of immigration, teachers asked this guiding question: How did early Wisconsin settlers from many cultures rely on each other to survive in their new land? With the help of Madison folk singer Ken Lonnquist and music teachers at Burleigh, students used the knowledge gained in their social studies lessons to create a unique presentation that integrated music, drama, language arts, and social studies.

Under Lonnquist's guidance, the students generated the story of a family that settled in rural southeastern Wisconsin in the 1800s. Because many of the students themselves are of German descent, they decided to use German immigrants as their main characters. Together they wrote the lyrics and put them to music. In the final performance, students sang the song and acted out the story. The result was a connected learning experience that could not have been matched by reading words in a textbook. All students were engaged and showed pride in what they had learned. This learning experience blended the disciplines of music, drama, social studies, and language arts in a natural and meaningful way.

EXCERPT FROM "A LETTER HOME"

(Lyrics and melody by Ken Lonnquist and fourth grade students at
Burleigh Elementary School, Brookfield, Wisconsin)

Dear Oma Liesel and Opa Heinz,
I take pen and ink now to write a few lines
Where the Wisconsin winter's so bitter and cold
(It preserves things so well, we may never grow old!)

I've wanted to write you much sooner, but I
with the grief and the hardship of saying goodbye
Had all I could do with the children and farm.
It took all of my will and the strength in my arm.

I've sad news to tell ... I don't know how to say ...
But your son—my dear Willhelm—two months now this day
Was lost to the cholera ... taken away
And our lives have been changing in so many ways,

Chorus:
In this new world
This sad world
This "risk everything you once had" world

Heinreich has moved off to Milwaukee
To find work and help support Gretchen and me
We miss him, but without the money we need
Which he sends us each month we could never succeed.

Chorus:
In this new world
This strange world
This everyday-things-seem-to-change-world.

Assessment through contributions to a student-designed web page

Student learning in the fourth grade unit was assessed through individual contributions to a student-designed web page on Wisconsin immigrants, connecting yet another discipline, technology. The Web page can be viewed at http://www.elmbrook.k12.wi.us/schools/bur/docs/www4th/m4 in its entirety. The integration of technology and the content of the unit is seamless. Writing in this electronic environment makes links to more information and explanations possible without interrupting the flow of the original information. Note that the underlined words in the following letter that was written by students and posted at the Web site are hyperlinks that lead to other Web pages, some of which include student art work. (For an academic example of such Web-based writing, visit the Cybernetica Mathematica Web Site at http://pespmc1.vub.ac.be/.)

Here is the letter:

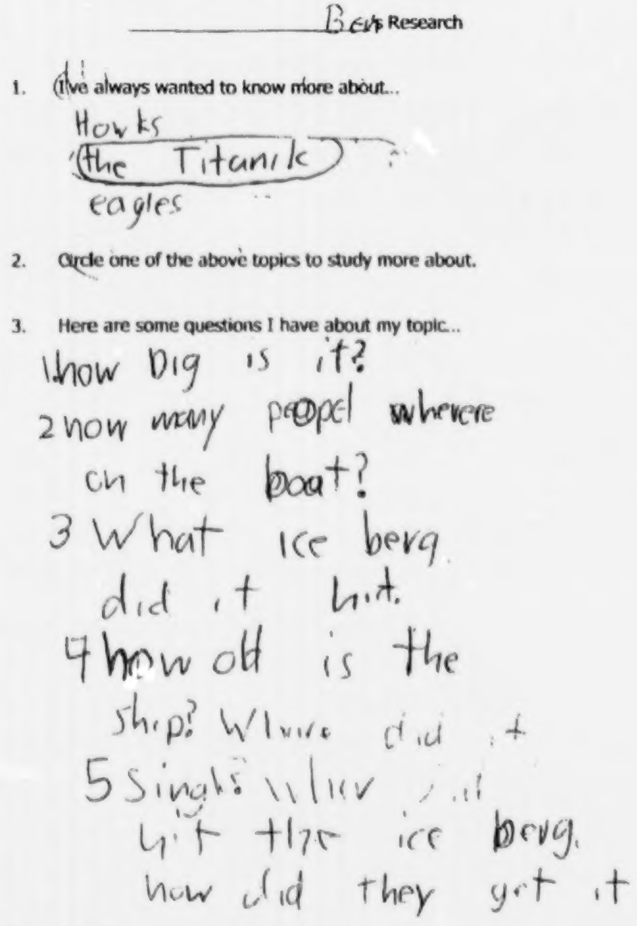
> Dear Matilda,
>
> We just arrived, and Ma has been working very hard. We miss you so much. Pa got sick and died on the ship. We were very sad. We arrived on January 1, 1861. Everyone was cramped and tired. It took a long time. Without Pa, we are working very hard. We settled near Milwaukee, Wisconsin. Ma said it should be better here.
>
> We just met our new neighbors, they're nice. To make us feel better they invited us over for a Polish night.
>
> We danced to the Polka. The women wore dresses and ribbons. Men wore hats, vests, brown leather belts, and boots. After that, we ate Polish food like we did with you. Everybody's favorite was the Prune Finger cookies, the recipe that you gave Ma. We also ate Mushroom Soup, cabbage, Polish sausage, pickle rye, and bubka bread.
>
> Then everyone went home, and Ma promised to make Polish oatmeal in the morning. It was excellent! We are going to start school soon. We will see other kids.
>
> Since Pa is not here to work in the factory we have to hunt and grow our own food. We have 10 acres of land. We are going to plant corn, beans, peas, potatoes, tomatoes, carrots, cucumbers, and wheat. We have 4 cows, 10 chickens, 2 pigs, and a flock of sheep. We spent almost all our savings on the livestock.
>
> We both are learning how to play the violin. We hope you're having fun. We miss you very much.
>
> Love,
> Karolina and Benjamin

Student-initiated research

The research in this unit was largely student initiated. This example reinforces what we have repeatedly emphasized throughout this book: Teachers are not the only ones to direct and plan units of study. Students can and should be given opportunities to ask questions and generate a process for learning more about a topic of interest. Looking at the broad scope of standards, it is not difficult to weave in opportunities for students to have input for some units of study. The example shown in Figure 11.2 is of a list of questions generated by a first grade student for his research on the *Titanic*.

Summary

The technique for designing curriculum, a teaching unit, or a lesson presented in this chapter suggests selecting a unifying theme, deciding which concepts should provide focus, and asking guiding or essential questions to direct student attention. All planning is based on the state or local academic standards.



Ben's Research

1. I've always wanted to know more about...

Howks
[✓ the Titanik]
eagles

2. Circle one of the above topics to study more about.

3. Here are some questions I have about my topic...

1 how big is it?
2 how many peopel where on the boat?
3 What ice berg did it hit.
4 how old is the ship? Where did it
5 Singk? Wher did
hit the ice berg.
how did they get it

FIGURE 11.2

Before discussing the importance of student assessment in this process, let us take a brief look at how curriculum mapping can become an organized process in a school building or a district. As obvious as the suggestions in the following section may look, teachers have found it useful to have common planning time. Building and district administrators have seen the long-term benefits of faculty sharing and mapping out what content they introduce at various points during the school year. Such sharing and mapping sessions lead to coherence and connected planning.

Curriculum Mapping

Curriculum mapping is a technique or strategy that openly shares curriculum with the student, parents, and teacher colleagues and provides a necessary basis for connecting what is already taught and learned. Curriculum maps are also a good tool to communicate school or district curriculum to parents.

Despite district curriculum committees, little communication occurs among teachers on a regular basis regarding what is taught on a monthly basis throughout the school year. Curriculum mapping provides the basis for ac-

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quainting all faculty with the course of study in each classroom from September to June. The curriculum-mapping process is built on communication among teachers. Mapping provides a tool for communicating about what is actually taught in each classroom. It opens up the process to everybody and thereby encourages connectedness. Curriculum mapping helps create an education that is deliberate, planned, thoughtful, and responsive.

Heidi Hayes Jacobs and Fenwick English are proponents of talking openly about the curriculum. Their approaches have many similarities, including a focus on the child's learning. They have found that teachers who discuss curriculum with each other begin to learn more about their own teaching. The teachers gain a shared ownership and responsibility for the big picture of educating the whole child. Heidi Jacobs notes that maps lead educators to a self-directed rather than imposed accountability. She recognizes that we must actively and collectively improve ourselves. Curriculum maps enable educators to prioritize and focus on common goals that can be clearly communicated to the general public.

So What Is Curriculum Mapping?

Specify content, skill, and assessment each month.

Curriculum mapping is a procedure for charting what is being taught and what should be taught. Through charting, teachers specify content, skill, and assessment emphasized each month, a process that allows them to take the following beneficial actions:

- Develop quality communication about actual curriculum within a department, school, and district.
- Identify gaps between and within departments and schools.
- Avoid unnecessary repetitions of content, skills, and assessments.
- Ensure spiraling of skills where appropriate.
- Ensure that a variety of assessment tools are used to match the different learning styles of students.
- Match actual curriculum with state standards.
- Provide opportunities for collaboration and interdisciplinary instruction.
- Promote confidence about what students are learning.
- Enable use of multiple assessment tools.
- Foster ongoing discussion and collaboration to improve the education for all students.
- Provide a vehicle for communication with parents about expectations.
- Encourage responsivity to achievement data.
- Ensure articulation that allows students to make connections.

How Do You Do Curriculum Mapping?

Step One: Each teacher completes a map, listing major content, skills, and assessments.

Step Two: Each teacher reviews all maps as completed by colleagues.

Step Three: A small group of five to eight faculty from different grade levels and different programs reviews the maps, looking for repetitions and gaps. The summary of conclusions is reported to all teachers in elementary school or an entire department at the secondary level.

Step Four: All faculty members then examine the compilation of findings from the small groups. They identify areas of repetition and gaps that can be addressed and which areas need further study.

Step Five: A building-wide curriculum council is created to review those findings and coordinate resolutions. Membership should rotate throughout an entire department or school. This is similar to step three, but this council makes recommendations based on findings of work groups in earlier steps.

Step Six: District-level curriculum councils meet to coordinate districtwide mapping efforts and results—and to study long-term issues.

Magee Social Studies Curriculum Mapping Committee Report, Summer 2000

Note: The following report including the curriculum map was provided by the School District of Kettle Moraine. The report should be read in conjunction with the maps. This is an example of curriculum mapping within a school district.

Process

The committee reviewed all the individual teachers' maps of current curriculum. We identified the following concerns:

- Everyone is teaching geography but without any coherent plan from grades K through 5.
- We have some redundancies, most notably in teaching about Native Americans.
- We have several gaps that show up as "empty boxes" in the following maps. There isn't a coherent scaffolding of skills and concepts for either government or history grades K through 5.
- Cultural studies is the weakest strand in our social studies curriculum.

Curriculum mapping is an open process, and the maps that appear in the following pages are works in progress. The committee spent many hours discussing and planning a logical sequence of content and skills. These maps represent our best thinking, but they are still subject to review and consideration by the entire staff. Ideally, everyone should have participated in the mapping discussions. Because this wasn't possible, we've tried to summarize the rationale for each of our proposals.

Curriculum mapping is an open process.

Geography

As we reviewed the maps, it was clear that in geography, we needed to "teach less, better." One of the problems we identified was that we weren't teaching skills in relevant contexts. It isn't useful to learn to identify the equator or lines of longitude and latitude if you don't need these skills to solve authentic problems. We also know that our children do not know much about the world outside of the United States. We decided to try to address these problems in a couple of ways. Children in the primary grades will begin to develop a geographic awareness of locations that they can explore—school, neighborhood, Genesee Depot, Waukesha County, and Milwaukee. In third, fourth, and fifth grades, geographic concepts expand to include major cities, regions, and states of our country.

In addition, each grade level is assigned a continent. We tried to assign continents to grade levels based on logical curricular connections. For instance, fourth graders study Wisconsin immigration, so it seemed appropriate that they should look at Europe because most Wisconsin immigrants came from there. In fifth grade, Africa is studied through the perspective of the slave trade and the Civil War.

It isn't our intention that each grade level will study everything there is to know about their continent but rather that the continent will become the vehicle for learning geographic features, using mapping skills, and exploring different cultures.

Many geography skills are taught in our Everyday Math Program, particularly in the fourth and fifth grades. We need to decide if this is a good resource, and if so, we need to use it consistently. Committee members also identified the need to teach geography through current events. *Time for Kids* and *Weekly Reader* were cited as good resources. (See Table 11.1.)

Government

Our current curriculum has a strong government component in grades 3, 4, and 5. The committee grappled with how primary teachers could lay the groundwork in the lower grades. We framed our essential question: How do people govern themselves? The job of a primary-age child is to learn to be a productive member of a group at home and at school. That's the beginning of government. Children will also learn about their local community in first grade and visit town hall. In second grade and third grade they learn that all communities have governing bodies. Third graders are introduced to the three branches of government. Fourth graders focus on state government, and fifth graders focus on the federal government. (See Table 11.2.)

History

Everyone has been teaching pieces of history. The committee tried to create a chronological presentation of U.S. history. The fourth grade's study of Wisconsin is a glitch in the sequence, but we think it is better than it was. Our essential question: How are we connected to people and events of the past? (Who settled this country? Where did they come from? Why did they come, and where did they settle?)

We addressed the redundancies in our study of Native Americans by identifying three different areas of focus. The second grade focus will involve these questions: Who were the earliest settlers? (Native Americans) Where did they come from, and where did they settle? In fourth grade the emphasis will be Wisconsin Native Americans, and in fifth grade, the study will be part of the study of U.S. history. (See Table 11.3.)

Economics

The study of economics is not a big focus in the elementary grades. In primary, children learn about money and its function. In the upper grades, students learn basic economic concepts and the cause-and-effect relationship between economic development and the history of our state and nation.

In addition, the committee noted that there were many opportunities to teach economic concepts in *Everyday Math*, *Time for Kids*, and *Weekly Reader*. (See Table 11.4.)

Culture

The committee grappled with the difficulty of teaching cultural diversity in such a homogeneous population. We also discussed the fact that much of our study of culture relates to traditional or ancient cultures. We decided we wanted children to know about their world as it exists today and to realize that although cultures differ, there are more commonalties than differences. We will look to our special area teachers to help develop an integrated curriculum for teaching cultural diversity. (See Table 11.5.)

Table 11.1 K–5 Geography

Enduring Understandings:

Students will understand that geography affects how people live, work, and play.
Students will understand that people either adapt to, or modify their environment as they live, work, and play.
Students will understand that people have created methods and tools to determine location on the earth.

	Kindergarten	**First Grade**	**Second Grade**
Content Knowledge of Geographic and Political Features	Universe, Earth, North and South Poles.	U.S., continents, Atlantic and Pacific Oceans.	Continents, oceans, equator, Northern and Southern Hemispheres, mountains, rivers.
Political Unit	School, neighborhood.	Our local community.	Comparing Wisconsin communities (town, village, city in various parts of the state).
Continent	Arctic, Antarctica.	Australia, Asia.	South America.
Essential Questions	What is a map? What is a globe? Where do I live? (each student's neighborhood) What is the Arctic? What is Antarctica?	How do people use maps? Where in the world is our community located? What are the seven continents? What and where are the Atlantic and Pacific Oceans? What is Australia? What is Asia?	Where are the seven continents located? How do we use hemispheres to divide the globe? How are communities alike and different? Where is our community in relation to other communities? What is South America?
Skills	Recognize difference between a globe and a map. Distinguish between landforms and water. Identify North and South Poles.	Map skills: Identify cardinal directions, equator, North and South Hemispheres, keys, and symbols. Identify what a community is.	Map skills: Identify and demonstrate use of compass rose and symbols. Draw and interpret maps. Show the difference between the Northern and Southern Hemispheres. Compare two communities.
Assessment	Locate the Arctic and Antarctica on a map and a globe. Color in map with land, water differences shown. Color in map with North and South poles, Arctic, and Antarctica shown.	Draw a simple map with at least two symbols in the key. Locate Australia and Asia on a map and a globe and show map directions.	Label continents on a blank map. Create a map incorporating mountains and rivers. Locate South America on a map and a globe and show directions. Label the hemispheres.

Resources

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Overarching Essential Questions:
How does geography affect history, economics, government, and the culture of people?
What changes do people make to their environment?
Where are we and how did we get there?

Third Grade	Fourth Grade	Fifth Grade
Hemispheres, prime meridian, three U.S. regions (eastern states, middle states, western states), states and capitals, intermediate directions. Major landforms.	Wisconsin: Great Lakes, main rivers, glacial formations and forests, longitude and latitude, political vs. physical maps.	50 states and capitals, longitude and latitude, time zones, maps and graphs.
City (Milwaukee) and comparing North American communities.	State (Wisconsin).	Country (U.S.).
North America.	Europe.	Africa.
How do physical and political maps differ? How do we use hemispheres to divide the globe (north–south and east–west)? What are the main geographic features of U.S. regions? How has geography affected U.S. regional development? What is a city? What is North America?	Why does Wisconsin look the way it does? How have Wisconsin's landforms and natural resources influenced Wisconsin development? Where would you have lived in presettlement Wisconsin? What is Europe?	Why does the United States look the way it does? How have U.S. landforms and natural resources influenced the United States development? What is a country? What is Africa?
Map skills: Identify and demonstrate use of intermediate directions, distance, scale, and coordinates. Identify physical vs. political boundaries.	Map skills: Locate place on map using longitude and latitude. Interpreting different types of maps, charts, and time lines. Identify what a state is. (World tour—math).	Map skills: Interpret contour maps. Identify key topographic features; use map keys. Memorize the 50 states and capitals. Interpret maps, charts, and time lines (World tour—math).
Multiple choice, short answer and essay questions about these skills. Locate U.S. regions on a map. Create project on Mexico and Canada research.	Locate European countries on a map and a globe.	Use longitude and latitude to locate something on a map and globe. Identify countries & continents on a map and a globe.

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Table 11.2 K–5 Government

Enduring Understandings:

Students will understand that the purposes of rules and laws (government) are to ensure safety, keep things fair, and help people get along.

Students will understand that government exists on different levels, each with a different function and format.

Students will understand that participation in civic activities contributes to the well-being of the community.

	Kindergarten	**First Grade**	**Second Grade**
Content	School rules, cooperation, and respect for others.	School rules, cooperation, and respect for others. Individual responsibility. Role of the U.S. president. Current president, significant historical figures and symbols. Local government (town hall).	School rules, cooperation, and respect for others. Individual responsibility. All communities have a governing body.
Political Unit	School, neighborhood.	Our community.	Comparison of different types of communities.
Essential Questions	What is expected of me at school?	Why are school rules important? Why are community laws important?	What is a good citizen? How do communities make decisions? What is the role of the U.S. president?
Skills		Understanding effects of personal behavior on group. Understand local government decisions.	
Assessment	Observation of school rules.	Observation of school rules. Identify what a community is.	Observation of school rules and classroom jobs. Create a Venn diagram to compare and contrast communities. Journal entry: "If I were president of the U.S., what would my role be?"

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Overarching Essential Questions:
How do people govern themselves?
Why do people need so many levels of government?
What can I do to help my community?

Third Grade	Fourth Grade	Fifth Grade
Three branches of government. City government, state reports.	Wisconsin: State constitution, three branches of state government. How a bill becomes a law. Virtualville.	Federal government: Separate powers of three branches. President's cabinet. Checks and balances, Constitution, Bill of Rights, Declaration of Independence. How a bill becomes a law.
City.	State.	Country.
Current Events →		
What is city government? What are the three branches of the federal government and what do they do?	What is state government? How does state government compare to local and federal government? How does a bill become a law in our state? How do we elect our government leaders?	What is the federal government? What are checks and balances? What is the significance of the Constitution, Bill of Rights, and the Declaration of Independence?
	Debating. Public speaking. Persuasive writing; research, identify, and solve current political issues; manage a campaign. Develop a basic understanding of our democratic election process.	Understanding how the government was developed.
Chart the branches of government with functions.	Convince your constituents that your issue is a problem and then explain how your role in government can solve that issue.	Demonstrate knowledge of separate powers of three branches of government.

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Table 11.3 K–5 History

Enduring Understandings:

Students will understand that we are connected to people and events of the past.
Students will understand that people from other countries settled in this country to gain freedom, democracy, justice, and economic opportunity.
Students will understand that people, places, and events show change over time.

	Kindergarten	**First Grade**	**Second Grade**
Content	School, neighborhood. Family traditions. Time and change: Day, night, week, month, year. Seasons.	Significance of major American holidays. Important historical figures and symbols. School history.	Wisconsin community history. Early North and South American explorers.
Essential Questions	How do we change over time? How do we know the seasons change? How do families celebrate Thanksgiving? What are harvest celebrations?	Why do we celebrate the holidays of Labor Day, Veterans' Day, Thanksgiving Day, Columbus Day, Presidents' Day, Martin Luther King Jr. Day, and Memorial Day? Who are important people in U.S. history, and why are they important? What is the significance of American symbols and figures?	Where did the first people to this continent come from?
Skills	Understand the differences between day, week, month, year.	Identify (list of historical names and symbols) and their contributions to the U.S.	Introduction of the movement of the first people across the land bridge and the Viking explorers.
Assessment	Daily calendar. Verbal statement of student's address. Develop time line of students' growth throughout the school year.	Identify significant historical people and their contributions to the U.S. Participate in school Patriotic Program.	Show the movement of the explorers to the northern and southern continents.

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Overarching Essential Questions:
How are we connected to events and people of the past?
Why would people leave their homeland and choose to live in the United States?
How has our country changed over time?

Third Grade	**Fourth Grade**	**Fifth Grade**
First Native Americans: (prehistory). Major groups by region: Northwest, Southwest, Plains, Woodland, Northeast, Southeast.	Wisconsin: Ancient history, explorers, Great Lakes, immigration, economic history, political history.	New World exploration and imperialism, Native Americans. Colonial history leading up to the Revolutionary War. Western expansion leading up to the Civil War and Reconstruction.
	"Inside Genesee" project.	
Where did the first Native American groups come from, and where did they settle?	What influences have Native Americans and immigrants had on the history of Wisconsin? Where did the Aztalan Indians come from? Why did they suddenly vanish? How did Native Americans lose their land to the European settlers?	Who were the first people to migrate to North America? How did New World settlers interact with earlier inhabitants of this country? How did imperialism and immigration change North America? How did colonial settlement evolve into a new country? Why did you do it, King George III? What events lead to the expansion of this country? What differences lead to the Civil War? What challenges did the U.S. face after the Civil War?
Interpret time lines. Identify cause-and-effect relationships. Compare and contrast.	Interpret time lines. Identify major historical events. Identify positive and negative effects of historical events. Compare and contrast.	Interpret time lines. Identify cause-and-effect relationships. Compare and contrast.
Show the movements of the first Native Americans on a map by drawing lines.	Show where you would live in presettlement Wisconsin and why. Answer the Aztalan essential questions. Complete a family tree. Compare and contrast old and modern farms.	Report or HyperStudio project on U.S. colonial research. Report or HyperStudio project on U.S. Civil War research.

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Table 11.4 K–5 Economics

Enduring Understandings:

Students will understand that people must make choices due to scarcity.

Students will understand that businesses and industry combine people, resources, and money to make production efficient.

Students will understand that money, banking, and saving play a role in everyday life.

	Kindergarten	First Grade	Second Grade
Content	Money as medium of exchange. Money value: penny, nickel, dime, and equivalents. Role of money in school.	Money value: penny, nickel, dime, quarter, dollar, 10 dollar, introduce 100 dollar. Exchanges and equivalents; saving money.	Local community: Differences between goods and services. Daily role of money in school and homelife.
Essential Questions			
Skills			
Assessment	Show understanding of use of money in school setting.	Show understanding of use of money in school and homelife setting.	Make a collage of community goods and services. Journal entry: "Explain how money is important to you in your homelife and at school."

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Overarching Essential Questions:
Why do we have to make choices?
What do we need to make things?
What is money and how does it affect our lives?

Third Grade	Fourth Grade	Fifth Grade
Business districts vs. residential areas. Difference between natural and man-made resources. Differences between goods and services providers. Current events.	Mines, timber, and farms: Industrial evolution of Wisconsin.	Comparison of economies in U.S. colonies: (agrarian vs. manufacturing) as a contributing factor to conflicts. How allocation of resources affect economic patterns.
	(World tour: foreign currencies and exchange rates)	
How do individuals and our community affect the economy?	Lumberjacks depended on Wisconsin forests to make a living. So why would they cut down so many trees that they and their children had no trees left to cut? Why would they work themselves out of a job? Are we using resources today that are not renewable?	
Identify area goods and services providers. Demonstrate understanding of how our community affects the world economy.	Create an argument for or against land ownership. Contrast the attitudes of early lumber barons, land owners, and Native American tribal leaders.	Create a U.S. colonial resource map.

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Table 11.5 K–5 Culture

Enduring Understandings:

Students will understand that people and the groups they belong to have similarities and differences.
Students will understand that people's behaviors are influenced by laws, rules, people, events, culture, and media.
Students will understand that cooperative skills are necessary in all social settings.

	Kindergarten	**First Grade**	**Second Grade**
Content	Multicultural holidays around the world. Arctic, Antarctica: Contemporary culture of the people, lifestyles, customs. Contributions: people, art, music, literature, etc.	Understanding cultural diversity. Australia, Asia: Contemporary culture of the people, lifestyles, customs (Chinese New Year). Contributions: people, art, music, literature, etc.	Understanding cultural diversity. South America: Contemporary culture of the people, lifestyles, customs. Contributions: people, art, music, literature, etc.
Art, Music, Literature Connections	Traditional folktales from Arctic cultures.	Traditional folktales from Australia and Asia.	Traditional folktales from South America.
Essential Questions	Who are the people of the Arctic, and how are they similar and dissimilar from us today?	Who are the people of Australia, and how are they similar and dissimilar from us today? Who are the people of Asia, and how are they similar and dissimilar from us today?	Who are the people of South America, and how are they similar and dissimilar from us today?
Skills			
Assessment	Project and books on multicultural themes.	Culminating activity for study of Australia and Asia.	Demonstration of things learned about South America. Journal entry: the people and customs of South America. Write about your penpal or E-pal.

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Overarching Essential Questions:
How are people alike and different?
Why do people act the way they do?
What do people do to get along?

Third Grade	Fourth Grade	Fifth Grade
Urban vs. rural culture. Regional differences in culture in the U.S. North America: Contemporary cultures of Canada and Mexico. Lifestyles, customs. Contributions: people, art, music, literature, etc. Traditional folktales from North America (U.S., Mexico, Canada)	Differences in cultural beliefs of Native American vs. European attitudes toward land ownership in Wisconsin settlement. Europe: Contributions of the ethnic groups that settled Wisconsin.	Colonists vs. England: Differences leading up to the Revolutionary War. North vs. South: Differences leading up to the Civil War. Africa: Contributions of African-American people to U.S. culture. Black History Month.
	Traditional folktales from European countries.	Traditional folktales from Africa.
How are the people from different U.S. regions alike and different? Who are the people of Mexico, and how are they similar and dissimilar from us today? Who are the people of Canada, and how are they similar and dissimilar from us today?	Who are the people of Europe, and how are they similar and dissimilar to us today and in a historical sense? Why did Europeans immigrate here? Where are your ancestors from?	Who are the people of Africa, and how are they similar and dissimilar to us today and in a historical sense? What is the significance of Black History Month?
	Identify the different reasons immigrants came to America; identify the different backgrounds people from Wisconsin have.	
HyperStudio project on Mexico or Canada research.	Write an expository piece comparing and contrasting life in Europe and the United States.	Research project on significant Black Americans.

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The Assessment Connection

Meaningful assessment connects to the standards, instruction, and the students. Districts around the state are adopting the standards, assessment, curriculum and instruction (SACI) model. Educators must realize that along with connecting to standards, assessment must also be relevant for students. Students must know their learning targets and have strategies for how to reach them. Traditional tests have often carried with them an element of surprise. Remember one's own experience of studying for a test, not knowing what one would be tested on or what material was most important? Remember the feeling of devastation when the test was on different material or in a different format than expected?

Today's students have much more opportunity to know their learning targets. With the use of checklists and rubrics, students can and should know their targets in advance. When guiding questions are used to develop cohesive units, students should be aware of them so that they, too, know the desired outcomes and expectations. When students are aware of the expectations, there are few questions about standards for performance, and the expectations for learning are clear. In fact, a successful strategy for motivating students is to involve them in developing the criteria for a performance. Student-generated rubrics and checklists often contain higher standards than we ourselves might have set! Students can also be involved in the development of a unit of study, selecting the conceptual lenses and writing the guiding question along with the classroom teacher.

Student-generated rubrics and checklists often contain higher standards than we ourselves might have set!

In order to develop skills for lifelong learning, students must learn at an early age to be responsible for their learning. Through self-reflection, self-assessment, and goal setting, students help plan for their continual growth and new learning. Black and Wiliam (1998) describe these skills as the key to student achievement. Students gain confidence and engage in the learning process when they learn to set goals, develop action plans, reflect on their progress, and revise their goals and plans. The learner must feel capable of learning. When students determine that they haven't done as well as they would have liked, they must develop new strategies for accomplishing their goals. No longer can students blame their intelligence or lack of skills for poor performance. In the past, many students have been able to remove themselves from the responsibility of learning. It is no longer acceptable for students to be unsuccessful and unmotivated. Educators need to guide students and help them learn how to set goals. We must instill in the very youngest children a desire for learning and the expectation that they are responsible for their learning. When students set goals, they are connected to the learning process. Students who are involved in assessing their own learning are motivated and engaged (Hansen 1998).

Students can be connected to their own learning process through goal setting and choice. At Burleigh Elementary, students in kindergarten through fifth grade set goals to improve their performance. At conferences, many students have an opportunity to share their goals and action plans with parents. Many have created an electronic portfolio and use this to present their progress to parents. Students create time lines and action plans to reach their goals, and they evaluate their progress at checkpoints along the way. Students learn the valuable skill of self-reflection as they think about their goal, their progress, and their next steps. Through self-assessment, self-reflection, and goal setting, students will be able to monitor their own learning and add a dimension of connectedness and purpose to their learning experiences.

Many school districts have engaged teachers in the process of developing performance assessments in a variety of subject areas. In the Elmbrook School District, students are assessed yearly in an integrated language arts assessment. Math assessments have been developed at the secondary level in which students must apply math skills such as measurement, graphing, and fractions in real-life situations. These are just a few examples that support the ongoing need to assess students in meaningful ways. We cannot rely on an occasional standardized test score to paint a complete picture of a child's learning. We also must find ways to connect that learning to a meaningful experience that provides motivation and learning for the long term.

Through self-assessment, self-reflection, and goal setting, students will be able to monitor their own learning and add a dimension of connectedness and purpose to their learning experiences.

Sample Thematic Unit Planning Template—Grade/Department

BIG PICTURE ______________________ YEAR ________

GRADE/DEPARTMENT ____________ FOCUS ____________

GUIDING QUESTION/CONCEPT

(What should students know and be able to do when the unit is completed?)

K–12 DISTRICT OUTCOMES

- ☐ Societal responsibility
- ☐ Creative expression and awareness
- ☐ Problem solving
- ☐ Decision making
- ☐ Communication
- ☐ Positive self-development
- ☐ Social and group interaction

ASSESSMENT STATEMENT

(How do we know what students have actually learned?)

ASSESSMENT TOOLS

(Type and Description)

- ☐ Checklist
- ☐ Rubric
- ☐ Observation
- ☐ Self-evaluation
- ☐ Peer evaluation
- ☐ Other

ASSESSMENT FORMAT AND CRITERIA

(What type of assessment will be used, and what are the criteria for performance?)

CONTENT AREA OUTCOMES (List contents areas with major outcomes below.)

Source: Adapted from Burleigh Elementary School, School District of Elmbrook.

Best Practice Profile

Classroom Connection: Discovery Lab

The Discovery Lab is a learning center that uses science and technology as a catalyst to develop students' skills in investigation and problem solving. Through unique integrated learning activities, students are engaged in real-life investigations of the world around them.

The lab provides a learning environment that

- Allows students to make discoveries as "research scientists" or "investigators" in a lab setting.
- Stimulates student and teacher interest in real-world science connections.
- Offers meaningful learning opportunities that are integrated with technology, math, social studies, writing, and literature to meet the diverse needs of students.
- Uses the scientific process as the focus for learning, where students learn to make observations and hypotheses, conduct experiments, collect data, and draw conclusions.

In the lab, a variety of learning centers includes a classroom learning area with a large state-of-the-art viewing system, an experimentation area, a computer center, and a research library. A videoconference center is currently being installed for distance learning and virtual field trips.

A key feature in the Discovery Lab is a special unit each year that is designed to meet the needs and interests of all students. A team of teachers and a community expert

Title: Awesome Bridges of the Past, Present, and Future
Source: Burleigh Elementary School

Related State Standards

Math
Geometry (Standard C)

Science
Science Connections (Standard A)
Science Inquiry (Standard C)
Science Applications (Standard G)

Technology
Nature of Technology (Standard A)
Human Ingenuity (Standard C)

School District of Elmbrook Program Outcomes

Math
Read, write, discuss, represent, and interpret mathematical ideas and real-life experiences.
Relate mathematics to other curricular areas.
Apply estimation skills to validate solutions.

Science
Formulate questions that can be tested or investigated.
Analyze cause-and-effect relations.
Explain and illustrate the relationship between science, technology, and society.

Technology
Demonstrate the ability to communicate using a variety of educational technologies.

Reading and Language Arts
Communicate in writing and speaking, using appropriate forms of language conventions for different audiences and purposes.
Analyze, synthesize, and apply information gathered from a wide variety of print and nonprint sources in creating oral and written communications.

Concepts: Problem solving, design

Connecting Elements

- Personal relevance
- Interdisciplinary associations
- Real-world connections
- Choice

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"Awesome Bridges of the Past, Present and Future"
Designed by: Marge Willms, Nancy Jacobs, Dr. Keith Faherty, Nancy Peebles, and Robin Schrot

work together to plan the unit. They design learning center activities appropriate for the wide range of students in grades K through 5, matching lessons to district and state standards. Sample units include "The Disappearance of Koko," an investigation in detective science, and "Awesome Bridges of the Past, Present, and Future," a unit on design and structure.

Awesome Bridges of the Past, Present, and Future

K–5 Activities

The Task

Students are to experiment with various bridge designs. They will construct bridges, test their load, and draw conclusions about their models.

Resources

Michael P. Kline, Carol A. Johmann, and Elizabeth J. Rieth, *Bridges: Amazing Structures to Design, Build & Test* (Charlotte, VT: Williamson Publishing, 1999).
Bridging the Future, Newton's Apple, 3M Productions
"Build a Bridge" Nova Web site, http://www.pbs.org/wgbh/nova/bridge.
West Point Bridge Designer (download public domain software at http://www.mhrcc.org/hfcsd/bridge.html)

The Process

General Activities

Watch Newton's Apple video *Bridging the Future.*
Bridge slide presentation (bring in engineer if possible)

Construction Stations

Each station focuses on one kind of bridge: beam, truss, suspension, or arch. The format for each station is the same. The components include Learn the Lingo (vocabulary activity), Act It Out (kinesthetic activity), Build with Blocks (directed activity to teach principles of design), and Using What You Learned (open-ended construction applying principles of bridge design).

Station 1: "Hanging by a Thread"—Constructing a Suspension Bridge

Learn the Lingo—Cables, towers, anchors.

Act It Out—Push and pull (Students will become a suspension bridge cable).

Build with Blocks—Lego Duplo suspension bridge (K–2), Lego Dacta suspension bridge (3–5).

Use What You Learned—Hang a suspension bridge.

Station 2: "The Amazing Arch"—Constructing an Arch Bridge

Learn the Lingo—Load, compression, tension.

Act It Out—Be a stone in an arch bridge (students will become parts of an arch bridge).

Build with Blocks—Lego Duplo Arch Bridge (K–2), Lego Dacta Arch Bridge(K–5), and Arch Bridge wooden block assembly.

Use What You Learned—Which arch bridge is stronger?

Station 3: "May the Force Be with You"—Constructing a Truss Bridge

Learn the Lingo—Deck, triangle, strength, stability.

Act It Out—Balance like a bridge.

Build with Blocks—Build the strongest shape and create team truss bridges using K'nex.
Use What You Learned—Popsicle stick truss bridge.

Station 4: "Beam Me Up"—Constructing a Beam Bridge

Learn the Lingo—Booming up, booming down, rigging, cantilever, abutment.
Act It Out—Create a cantilever (students balance a ruler on their finger to feel the forces).
Build with Blocks—What makes a beam bridge strong?
Use What You Learned—Making the longest cantilever bridge.

Technology (Could be done in the computer lab or using your classroom computer)

1. West Point Bridge design software
2. "Build a Bridge" Nova Web site

Learning Advice

After a general run-through of the format of each station, older students should be able to follow directions at the centers. For younger students, a parent volunteer at each station is helpful. Allow students to conduct multiple trials of bridge construction if possible.

Conclusion

Ask students to look around in their community for the different kinds of bridges that have been built. Students can look in their own environment for a problem that they could solve through the construction of a bridge and actually design it as a community project.

Making Connections through Expeditionary Learning

12

This article was submitted by Thomas Van Winkle, former principal at Winnequah Middle School in the Monona Grove School District. Winnequah is an Expeditionary Learning Outward Bound School where curriculum is integrated through learning expeditions. This approach to connected learning challenges students and teachers intellectually, physically, and emotionally. Learning therefore becomes a holistic experience.

The students decided to christen her *Our Golden Dream*. The name couldn't be more fitting for this floating mahogany masterpiece—a 17-foot ocean-touring kayak. Building *Our Golden Dream* reflects the reality that learning happens best with emotion, challenge, and the requisite support. Students discover their abilities, values, grand passions, and responsibilities in situations that offer adventure and the unexpected. *Our Golden Dream* exhibits the charm, beauty, and authenticity of learning when a curriculum is thematic and connected in its approach. The project required perseverance, collaboration, fitness, craftsmanship, imagination, and self-discipline. The final product was a significant achievement that was characterized by rigorous academics and relationship building.

The students ventured into the uncharted waters of English, social studies, science, technology, and art as they conducted an in-depth study of kayaking and kayak construction.

The kayak expedition represents just 1 of 14 learning expeditions implemented at Winnequah Middle School in Monona, Wisconsin, during the 1999–2000 school year. After receiving a comprehensive school reform grant in 1999, the staff at Winnequah set out to transform it into an Expeditionary Learning Outward Bound school. Expeditionary Learning is a design for school reform that challenges K–12 students to meet rigorous academic and character standards. Expeditionary Learning staff collaborate with the Winnequah staff to make the school a safe, engaging community where all students are expected to achieve more than they thought possible.

Expeditionary Learning extends the experience of Outward Bound, an adventure and service-based education program founded by educator Kurt Hahn, into public school. Just as on wilderness courses, students in Expeditionary Learning schools learn to work together in teams, rise to seemingly impossible challenges, and use their knowledge in service to the community.

Learning expeditions are long-term, multidisciplinary explorations of a single theme or topic, such as hunger, water quality, the Holocaust, or personal achievement.

Learning expeditions are long-term, multidisciplinary explorations of a single theme or topic, such as hunger, water quality, the Holocaust, or personal achievement.

At the heart of the design is the learning expedition. Harnessing the power of adventure and discovery, expeditions take students on intellectual

FIGURE 12.1 **A new kayak is almost finished.**

journeys with challenging projects, fieldwork, service, performances, and celebrations. Teams of teachers at Winnequah design their own learning expeditions so that they are aligned with Wisconsin state local district standards. The expeditions are meant to motivate and compel students to learn the skills and content they need to produce high-quality, original work and to excel on the standardized tests by which student and school performance are regularly evaluated.

The basics are not abandoned. Rather, they are built into the learning expedition time line.

Students in the midst of a learning expedition engage with challenging content and skills that have contextual meaning and importance. Each expedition proceeds through distinct stages. In the beginning, students are immersed in an experience that captures their interest in the topic or theme. This immersion is followed by a sequence of skill building and closely supervised project work and, finally, by a more independent challenge in which students apply and present their knowledge to an audience of significance. Throughout the learning expedition, teachers are expected to hold high expectations for all students and to provide time and structure for the sustained effort needed to produce quality work through multiple revisions. To honor the hard work of everyone involved, an expedition often culminates in a celebration that includes families and community members. On the maiden voyage of *Our Golden Dream,* community members and even the media were invited to celebrate the accomplishments of the boat-building students.

At Winnequah, learning expeditions are becoming the central focus of curriculum and instruction, not an add-on or enrichment activity. Our goal is for learning expeditions to become the primary method by which students learn the content and skills they need to understand. They are an important part of the strategy to prepare students for state assessments. The topics, questions, and goals that give shape to learning expeditions are informed by local district and state standards. To accommodate the expeditions, the school provides flexible schedules and significant planning time for the teaching staff. A flexible block schedule has been one of the keys to success at Winnequah.

The Winnequah staff is mindful that whether or not a particular content area fits into an expedition, all Winnequah teachers can promote, support, and reflect the design principles in their classroom on a daily basis.

Not all of the curricular areas can, or should be, incorporated into expeditions.

No curriculum should ever be forced to fit into a thematic learning expedition. This is yet another reason why a flexible schedule is important to this design. Time can still be allocated to the curricular areas that do not fit into a particular expedition.

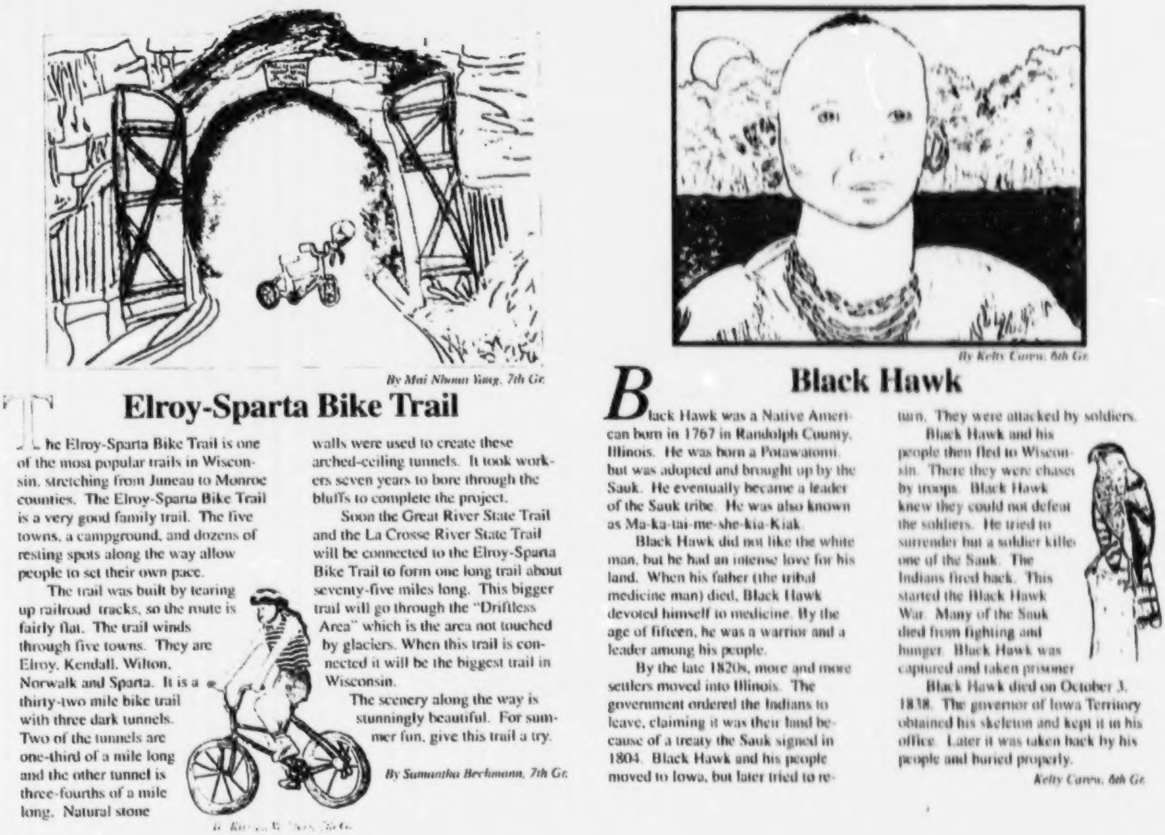
Professional development plays a key role in the Expeditionary Learning model. If you wish to improve instruction, you must know in what direction you are headed, and you must invest in the professional development of each and every staff member. This is perhaps one of the most striking and exciting aspects of this reform design. Most of Winnequah's veteran staff have been saturated with piecemeal "sit and get" in-service sessions and faculty meetings for more than two decades. Now, a leadership team made up of staff, in concert with our Expeditionary Learning school designer, maps out the school year in-service activities in order to align them with design goals. Every in-service opportunity and most staff meetings are dedicated to a different aspect of improving our educational practice and enhancing student achievement.

In addition to the on-site technical assistance that is provided by the Expeditionary Learning school designer who works directly with our school, all Winnequah staff have the opportunity to participate in Outward Bound educator courses and summits. The educator courses offer the opportunity to become students in challenging backcountry and urban expeditions. Whether the experience is whitewater rafting in Utah; sailing in Penobscot Bay, Maine; canoeing in the Boundary Waters of Minnesota; kayaking in Lake Superior; backpacking in the Blue Ridge mountains; or exploring the diverse communities of New York City, these courses have challenged Winnequah staff physically, emotionally, and intellectually beyond the reaches of any professional experience they have had before. Summit experiences are less physically rigorous than the educator courses. They are residential, intensive, week-long learning experiences that enrich a person's understanding of the Expeditionary Learning design principles.

As the teachers leave their comfort zones, they experience first-hand what it is like to be a learner again.

These courses have been life-changing experiences for many of our staff. And we have discovered that these experiences have far greater impact on the classroom and culture within the building than any other professional opportunities they have had before.

A real-life expedition is a journey with a purpose. Prior to becoming an Expeditionary Learning school, Winnequah staff members experienced a very successful multidisciplinary unit of instruction. As a matter of fact, I believe that the undertaking, which was to have the entire school write, illustrate, and professionally publish a book, *Wisconsin for Kids by Kids,* probably helped solidify our decision to become an Expeditionary Learning school.



By Mai Nhuun Yang, 7th Gr.

Elroy-Sparta Bike Trail

The Elroy-Sparta Bike Trail is one of the most popular trails in Wisconsin, stretching from Juneau to Monroe counties. The Elroy-Sparta Bike Trail is a very good family trail. The five towns, a campground, and dozens of resting spots along the way allow people to set their own pace.

The trail was built by tearing up railroad tracks, so the route is fairly flat. The trail winds through five towns. They are Elroy, Kendall, Wilton, Norwalk and Sparta. It is a thirty-two mile bike trail with three dark tunnels. Two of the tunnels are one-third of a mile long and the other tunnel is three-fourths of a mile long. Natural stone walls were used to create these arched-ceiling tunnels. It took workers seven years to bore through the bluffs to complete the project.

Soon the Great River State Trail and the La Crosse River State Trail will be connected to the Elroy-Sparta Bike Trail to form one long trail about seventy-five miles long. This bigger trail will go through the "Driftless Area" which is the area not touched by glaciers. When this trail is connected it will be the biggest trail in Wisconsin.

The scenery along the way is stunningly beautiful. For summer fun, give this trail a try.

By Samantha Bechmann, 7th Gr.

By Kelly Carew, 6th Gr.

Black Hawk

Black Hawk was a Native American born in 1767 in Randolph County, Illinois. He was born a Potawatomi, but was adopted and brought up by the Sauk. He eventually became a leader of the Sauk tribe. He was also known as Ma-ka-tai-me-she-kia-Kiak.

Black Hawk did not like the white man, but he had an intense love for his land. When his father (the tribal medicine man) died, Black Hawk devoted himself to medicine. By the age of fifteen, he was a warrior and a leader among his people.

By the late 1820s, more and more settlers moved into Illinois. The government ordered the Indians to leave, claiming it was their land because of a treaty the Sauk signed in 1804. Black Hawk and his people moved to Iowa, but later tried to return. They were attacked by soldiers.

Black Hawk and his people then fled to Wisconsin. There they were chased by troops. Black Hawk knew they could not defeat the soldiers. He tried to surrender but a soldier killed one of the Sauk. The Indians fired back. This started the Black Hawk War. Many of the Sauk died from fighting and hunger. Black Hawk was captured and taken prisoner.

Black Hawk died on October 3, 1838. The governor of Iowa Territory obtained his skeleton and kept it in his office. Later it was taken back by his people and buried properly.

Kelly Carew, 6th Gr.

FIGURE 12.2 **Two pages from *Wisconsin for Kids by Kids*.**

Students made requests to revise their own work and surprised the teachers when they were not yet satisfied with their work.

Wisconsin for Kids by Kids is divided into three sections—people, places, and past events. Sixth graders illustrated and wrote the people section. Seventh graders worked on places, and eighth graders produced the events surrounding Wisconsin history.

Students made requests to revise their own work and surprised the teachers when they were not yet satisfied with their work.

Pat Howell, a Winnequah special education teacher who served as the book's project coordinator, got the idea for it after reading *M for Montana*, a similar project. Without knowing it, Howell followed the principles of designing a quality learning expedition. She invited experts to work with the students as they created the book. Editors and journalists from Madison magazines and newspapers provided assistance in writing and editing. Professional illustrators assisted on-site student artists. The involvement of professionals added a dimension of legitimacy to the project. Building a culture and expectation of revision fits the Expeditionary Learning model. Rather than teachers forcing students to redo, students made special requests to keep working on the book.

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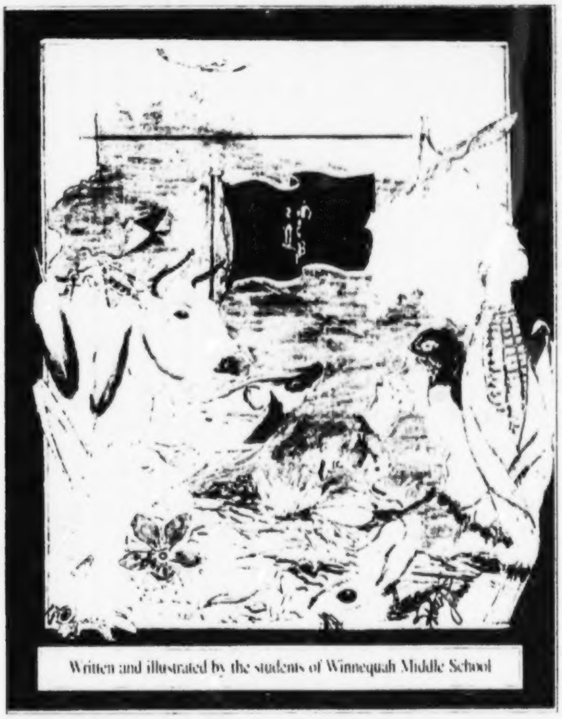

Written and illustrated by the students of Winnequah Middle School

FIGURE 12.3 **The cover of *Wisconsin for Kids by Kids*.**

The book's layout and design were completed during the summer of 1998. Involving community resources, Howell and the students raised donations to help pay for the $15,000 printing fee. The student response to the book was overwhelmingly positive, and its quality and success surprised many of those who helped with the project.

Statewide response to the publication has been awe-inspiring. In addition to praise from the state superintendent and governor, the State Historical Society awarded the project high marks. Perhaps the most satisfying accolade, however, is that the book has been purchased by several school districts to be used in their fourth grade Wisconsin history units. Praise from our peers is the most rewarding. Howell and her colleague, Norma Hessling, have now completed a teacher's guide and student workbook for the book. Information on these items can be obtained by contacting the school.

As we move forward with Expeditionary Learning, we plan to make projects like *Wisconsin for Kids by Kids* the norm rather than the exception. Our experiences thus far, successful or not, have convinced us that Expeditionary Learning is the right design for our school.

You can learn more about Expeditionary Learning Outward Bound on their Web site: http://www.elob.org. Find out more about current projects at Winnequah Middle School.

Making Connections through Assessment

13

This chapter looks at different types of assessment through the lens of balance. Connected assessment should balance traditional and performance-based approaches, as different types of assessments serve different purposes. A discussion of Arts Propel describes an integrated approach of instruction and assessment. Many of the assumptions about connected learning presented throughout this book are reinforced in this section.

Assessment in a connected curriculum seeks balance between traditional and performance-based evaluation components in creating a comprehensive picture of student growth in knowledge, process skills, and positive work habits. Recalling foundation information and using basic skills are necessary and important but are only a starting place. If we want to assess fully what students know and are able to do, we must measure what they can do in authentic, real-life situations. That can be done by making the student a copartner in judging their level of attainment and proficiency in specific and open-ended performance assessments that include portfolios, products, and performances.

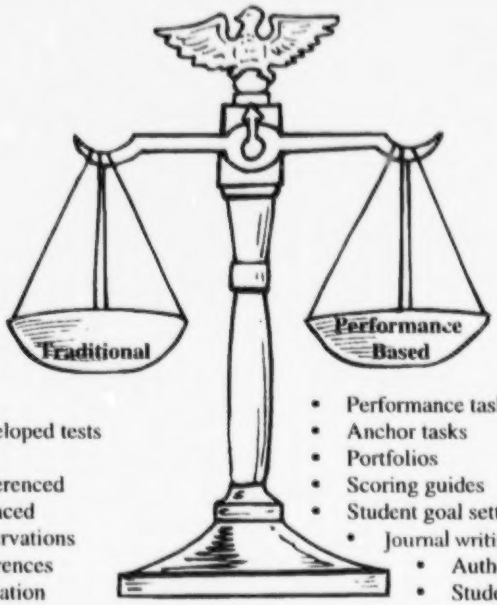
Assessment in a connected curriculum seeks balance between traditional and performance-based evaluation components.

Performance-based assessments (Hibbard 1996) have a place both in summative and formative assessments. Formative assessments are used to document and diagnose student progress in the classroom. These give both teacher and student valuable information about continuous teaching and learning; they can include paper-and-pencil tests but more often give students the opportunity to demonstrate what they learn in a variety of ways over an extended period of time. They offer a series of snapshots of student work, revealing to students and teachers not only what but how they are learning (Wegner 2000). Many of these assessments require students to go beyond the textbook in applying what they have internalized.

Summative assessments, on the other hand, are used to determine student attainment of specific and stated goals. The grades assigned to student work in summative assessments are used for accountability purposes. Performance-based assessments have not been widely used for large-scale accountability purposes, mainly because of difficulties associated with validity and test design.

Both formative and summative assessments should test what students know and are able to do as defined by academic standards. The National Research Council describes the relationship between assessments and standards in science as follows: "If the Standards are to be realized, summative as well as formative assessment must change to encompass these goals. Assessment

Connected assessment leads to balance.



- Grades
- Teacher-developed tests
- Quizzes
- Criterion referenced
- Norm referenced
- Teacher observations
- Parent conferences
- Final examination
- Report cards
- Advanced Placement exams

- Performance tasks
- Anchor tasks
- Portfolios
- Scoring guides
- Student goal setting
  - Journal writing
    - Authentic performance
    - Student lead conferencing
  - Projects
  - Self-assessment

FIGURE 13.1 **Connected assessment leads to balance.**

for a summative purpose (for example, grading, placement, and accountability) should provide students with the opportunity to demonstrate conceptual understanding of the important ideas of science, to use scientific tools and processes, to apply their understanding of these important ideas to solve new problems, and to draw on what they have learned to explain new phenomena, think critically, and make informed decisions" (National Research Council 2001, 60).

Performance Tasks

Performance tasks provide an opportunity for students to demonstrate skills and knowledge (Rogers and Graham 1998). They may be highly structured, in which case students complete specific elements which are rated according to clearly stated criteria. They may also be informal, spontaneous assessments in which the teacher observes students during instruction to diagnose skills and plan instruction (see Figure 13.1).

In performance assessments teachers are able to observe and collect evidence of student work that demands application and transfer of learning. They also have the opportunity to observe characteristics such as cooperation, persistence, and creativity.

Developing Quality Performance Assessments

The following guidelines are meant to assist educators in writing their own performance assessments and tasks.

- Students should easily recognize the relevance of the task to their own lives.
- The task should be manageable within a clearly established time frame.
- The assessments should be criterion-based.
- Scoring guides and rubrics should be as specific as possible and discussed with students prior to the assessment.
- Outcomes should result in a tangible product or performance.
- Task development should be understood as a process that demands ongoing review of both the activity and scoring component.
- Assessments should be given over an extended time frame and focus on various applications of content, skills, and dispositions.
- The task can be an individual or group activity.

Performance tasks may be simple or complex. They may be formative, providing checkpoints and defining further instructional needs. They may also be summative, showing end-of-unit or end-of-year mastery. A child may classify objects, plants, or animals and go on to use this information in the more complex task of setting up a database for use by the class in science. As tasks become more complex, they also become more interdisciplinary in nature. Reading, writing, and math skills naturally weave into tasks that focus on social studies, science, or the arts. Students, therefore, begin to see learning as integrated rather than as something that occurs in isolated segments.

Instead of taking a printed test to check reading skills, a child may read (perform) a passage or record oral reading. A written response and artwork related to the passage could be added to give a more complete impression of student work. If improved expression in oral reading is an area of identified need, students will receive specific feedback and will usually be asked to evaluate their own progress.

Reports and group presentations lend themselves to performance tasks in social studies, foreign languages, mathematics, and science. Any knowledge or skill that can be demonstrated has the potential for a performance task and therefore for performance assessment. The student's ability to develop a quality piece of work is as central to evaluation as is accurate information.

Projects

Often performance tasks are called *projects*. Projects have long been in use, sometimes in an attempt to organize the entire curriculum around student- or teacher-directed cross-disciplinary work (Kilpatrick 1926) but more often as short- or long-term student work. Projects are performance tasks and may therefore involve written, visual, and oral components.

As in all cases of performance tasks, projects must be evaluated based on clearly identified criteria that are presented to the students in advance. Projects are rich in opportunities to evaluate students' organizational skills, coop-

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eration, and ability to synthesize knowledge in true demonstrations of understanding. All developmental stages of a project, including a final product, should be included in a portfolio. Snapshots of student work in this portfolio communicate learning progress for assessment purposes.

Examples of Performance Assessment Tasks

- Artwork
- Cartoons
- Collections
- Designs and drawings
- Games
- Inventions
- Original plays or stories
- Musical compositions
- Science fair projects
- Models
- Journals or diaries
- Video or audiotapes
- Displays
- Recipes
- Scale drawings or models
- Surveys
- Essays
- Books
- Maps
- Dramas
- Interviews
- Oral presentations
- Pantomimes
- Dances
- Puppet shows
- Manuscripts and stories
- Science experiments

A balanced assessment package is tuned into the evolving needs of the learner.

Few teachers or administrators will debate the merits of an assessment plan that attempts to balance traditional and more participatory types of evaluation. A balanced assessment package is tuned into the evolving needs of the learner and provides opportunities to access, evaluate, and use information in situations that demonstrate an ability to work independently and collectively in completing a meaningful task or solving a real life problem. This is good for the student, and it is supported by the academic standards.

Consider the following assumptions that clarify the underpinnings of a meaningful, balanced assessment package:

- Evaluation strategies are standards based.
- Evaluation strategies reflect a balance between traditional and performance-based assessments.
- The ultimate goal of assessment is to assist a learner in becoming increasingly self-directed, motivated, and evaluative.
- Assessment cannot be divorced from curriculum (the what) and instruction (the how).
- Teacher-developed evaluation should mirror state-mandated tests in formats and emphasis on process skills such as
    Gathering information
    Organizing information
    Analyzing information
    Generating ideas
    Synthesizing elements
    Evaluating outcomes

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- Existing successful evaluative practices can be extended or modified to align with tested performance standards.
- Anchor tasks are identified for each grade level or subject area that provide a common, internal measure of proficiency within a school or across the district.

Portfolios

A *portfolio* is a purposeful collection of student work that exhibits efforts, progress, and achievements in one or more areas over a significant period of time. The collection must include student participation in selecting content, the criteria for selection, the criteria for judging merit, and evidence of student self-reflection.

A portfolio is a purposeful collection of student work that exhibits efforts, progress, and achievements in one or more areas over a significant period of time.

Portfolio assessment is appropriate for ongoing evaluation in writing, reading, mathematics, science, and the fine arts. The portfolio is a way to physically store student work, which can include video or audiotapes of musical or theatrical performances.

Portfolios could include samples of paintings, drawings, stories, letters, poems, lists, signs, handwriting, and use of numbers. They are based on multiple sources of information that can be collected over a year or several years in the school setting. Therefore, the work can show the pupil's learning history and perhaps help to predict future achievement.

Decisions must be made about what kind of student work to include: best work only, work over a period of time, work across subject areas, or work related to a specific subject. The purpose should be to show a record of a student's development. Therefore, comments and feedback provided by teachers should be included with student work samples. Copies of the work of others who may have collaborated with the student may also be included.

Because a portfolio can take up much space, decisions must be made about which items are kept and for how long. As technology is becoming more available and affordable, it is possible to store many items in a secondary format, such as video clips.

Top 10 Reasons to Use Portfolios

- Establish student accountability for reading, writing, and mathematics.
- Develop student interest and skills in self-assessment and self-selection of portfolio concerns.
- Recognize reading and writing as developmental processes.
- Give students more ownership of their learning.
- Develop self-esteem.
- Make assessment collaborative.
- Make assessment a continuous process rather than one that occurs only at the end of instruction.
- Establish a closer bond between home and school.
- Provide a longitudinal record of student growth.
- Blur the lines between instruction and assessment.

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Making Connections through Arts Propel

The Arts Propel model (Winner 1991; Gardner 1990, 1993a, 1993b; Farrell 1997) is one that changes education from the teacher-directed mode of instruction to that of the teacher as the guide, facilitator, or even mentor for student learning. Students become the researchers, collaborators, and constructors of their own knowledge. Arts Propel is based upon the following specific principles of education that researchers from Harvard's Project Zero, the designers of this model, have observed as they sought to better understand how children learned in the arts and how that learning was assessed and documented:

- Students can construct their own knowledge in a meaningful manner. Understanding occurs not when students memorize facts and concepts but when they are responsible for discovering, interpreting, making or doing an activity, and analyzing this information.
- This construction of knowledge is heightened when the student is actively engaged in inquiry, finding the solutions to a problem or question as opposed to the teacher providing the information and requiring students to come up with an answer that is already predetermined.
- Open-ended questions provide the format for learning so that many interpretations to a single question or problem can be considered by students as they move closer to finding their own conclusion. In many situations, there is no one right answer.
- Instruction encompasses a variety of approaches. When necessary, structured and teacher-directed activities help students learn basic skills and concepts. When possible, students solve problems in unstructured and open situations—albeit under the guidance of teachers. Students are involved in setting the problem or questions, establishing goals, and identifying criteria necessary for that learning. In this way they can buy into their own learning and become responsible for it (see also chapter 2).
- Students acquire deep understandings when they produce or perform, perceive, and reflect throughout the learning process. Production and performance includes all of the arts in the doing-and-making process; perception, an understanding of the elements and concepts of works of art in and through all of the senses—their own and those of others; and reflection, the ongoing assessment of process and product, and revisions during the learning process—what worked, what didn't work, and how can it be made better. Peer and teacher assessments strengthen understandings of each work and help to inform the students of their work.

The Arts Propel model provides a format for instruction in all curricular areas with instruction based on long-term, in-depth projects.

The Arts Propel model provides a format for instruction in all curricular areas with instruction based on long-term, in-depth projects. Construction of knowledge, skills, and concepts is consistent with study over time for students to achieve true understanding. A student needs to build a base of knowledge in order to make newly acquired information meaningful. Authentic projects in which students are actively involved motivate and challenge them to take responsibility for their learning—using inquiry as the process of forming ideas and new knowledges.

Three educational vehicles are used to initiate and develop this into a meaningful and rich process:

- *Domain projects* are areas of study that are central to the curriculum. These are the things that students should know and be able to do and are aligned with the standards. They are designed through a collaboration of the students and the teachers. This might be a theme, a question, or a problem on which students work to find new solutions or answers. It might involve students in reading, interviewing, viewing, listening, writing, drawing, building, designing, computing, moving, signing, and acting or a combination of all of these and other approaches to create new meanings. With the different intelligences and styles of learning in a classroom or school, there are many opportunities for each student to acquire deep understanding through various tools for learning. It is also an opportunity for students to grow at their own rate of learning and find success as opposed to disillusionment in the learning process.
- *Journals* are used to describe thoughts, ideas, and understandings. They can be used as a way for students to record their ideas, successes, and challenges of the working process. It is a way to record reflections and revisions that have taken place in the work. It is also a way for the teacher to better understand each student by comments that are made regarding struggles the student has in the learning process and how that teacher can better assist students so that they can reach their potential. Drawings, diagrams, illustrations, and photos can also be included, depending upon the unit of study and the goals to be achieved.
- *Portfolios* are the vehicle for revealing student growth in the process of learning that has taken place throughout the year. A portfolio validates the learning process and helps the student, teacher, and parents understand what learning has occurred. It is not the repository of the best works of the student but a record of all learning from the initial words, notations, sketches, ideas, tapes, video, and other structures to the final product. These records take many forms from a small folder to a large bundle. In many cases, a portfolio can be kept and maintained on the Internet to maximize its use as a communication tool among teachers, students, and larger learning communities. Sometimes, portfolios move with the student to show growth and understandings from kindergarten through grade 12.

The Arts Propel model is more than an instructional model. It is a method in which instruction, learning, and assessment are all inclusive and become circular. One is not more important than the other—they are all linked to providing better student knowledge and skills in which students become the constructors of knowledge and responsible for their own learning.

Marching to a Different Drummer?

14

We are on the brink of some dramatic changes in teaching and learning. Some of these changes have been and will continue to be affected by changes in communications technology. Changes in the medium of delivery have always had significant impact on message and content. What may lie ahead of us? Join us in reflecting and sketching out possible future developments.

Oskar is the drummer in Nobel laureate Günter Grass's well-known novel *The Tin Drum*. One scene has him sitting underneath stadium bleachers, stubbornly drumming a three-quarter beat as a Nazi military band plays marching tunes. Oskar's drumming, even though it is drowned out by the band at the beginning, prevails. After a short while everyone is up and dancing to the tunes of Viennese waltzes.

It probably takes someone like Oskar who can help us march to a different drummer, someone who can help us with our attempts to better the education system. Ernest Boyer (1993, 1995) and John Dewey (1966, 1974) have been such reformers, as have William Heard Kilpatrick (1918, 1924) and others. Just as Bobbitt (1912, 1918), Snedden (1931), or Taylor (1911) designed a "socially efficient curriculum" for the Industrial Age, we may have to think of new curriculum designs for a postindustrial Technological Age.

In this book we have made a case for curriculum connections. We have pointed out that knowledge is unified and that the divisions in a traditional curriculum are artificial and serve as testimony to our limited understanding of the universe. We have said that it takes considerable effort to overcome these divisions in the current school system, which was built on the notion that specialists can study their disciplines at great depth only in isolation. By and large, this is also a system in which teachers are still seen as the dispensers of knowledge, a system that struggles with the notion that students can access information from a variety of different sources. The contributions in this book show how corrections can be made to this school system built on separation of skills, but we are still left with basic questions:

1. How can we design an educational system in which the expectations go far beyond mastering the important skills of reading, writing, and simple math, one in which students can be guided through their own explorations, learning processes, and research projects?
2. Can progress in technology help to individualize learning? Can we use technology to the point where we can indeed have children of all abilities in our classroom and at the same time differentiate their curricula so to fit

their individual needs and interests? Can we allow for children to be truly grouped according to their intellectual and behavioral age rather than according to their biological age? Again, can technology help us overcome the lockstep curriculum that we need in the current system?

Paul Treuer's contribution in the technology section of this book may point to future developments. If the locus of control for keeping student records and portfolios can shift from registrars to student-kept and maintained electronic portfolios, why can't similar individualization happen in learning design as well? Technological solutions already make it possible for teachers to support their students' learning progress through the construction of Internet sites. In this scenario student and teacher could be in constant communication. Is that the future?

In higher education more and more communication between teacher and student occurs via E-mail. Professors are accessible outside their office hours. Students can send their questions or comments whenever they want, even at three o'clock in the morning.

Developments like these will shift the locus of control more and more from teacher to student. Imagine a nonlinear curriculum, one in which students can skip, rewind, go back, and progress when they need to do so, not when the school decides that this needs to be done. Imagine children growing up in a media-governed environment that keeps pushing them into more and more nonlinear thinking. Imagine that traditional story lines do not have the same meaning for children influenced by television, CDs, computer games, and the Internet. Today's teachers and parents grew up differently; our learning has always been linear and largely book- and text-bound. Is that the reality that we have created for our children? If not, do we not owe it to our children to be educated in an environment that resembles their real lives?

Making information in schools subservient to what the teachers know or don't know makes little sense in an information age. It is possible to develop courses and curricula, along with professional practices, that allow for student exploration beyond fixed parameters. Excellent teachers who can operate comfortably in this environment are part of the real worth of a school.

Gary Rowe, president of Rowe, Inc., in American Association of School Administrators (1999)

Literacy has always meant learning how to read and decode texts. In today's digital environment, this task may become somewhat more complex. Reading experts today grapple with the expansion of the concept of literacy to an Internet environment. None of this means that basic reading skills are not necessary any more; it does mean that the challenges for our students are different and probably more difficult than they have been for us. Yet we have no real answers to all these questions.

Interestingly, various art forms have always played with different interpretations of literacy and even with attempts to represent visions of reality in nonlinear ways. We think of Bertolt Brecht's theater plays that challenge the audience to participate and not simply to consume. We think of James Joyce's stream of consciousness in *Ulysses*, or we think of Bazon Brock's attempts to utilize the new technology of stereophonic sound for radio plays. These plays have no simple story line; there is no linear narration. The listener is supposed to construct meaning and thus interact with the cues given by the author. How would these authors use today's electronic digital environment? What does the distribution of movies on the Internet mean for linearity of plot and story line? Will movies on the Internet be the same as movies on the big screen?

Let us briefly look at other potential consequences of technology in the education process.

Individualized instruction for students is already frequently offered through the Internet. Students can take advanced courses by signing up for a Web class conducted by teachers or professors at a remote site.

Distance education is often used by small school districts that cannot afford to employ teachers in areas such as foreign languages. The teacher–student community goes well beyond the walls of school buildings in these cases.

Virtual schools are beginning to claim a share of the education market. The more parents and students, or even school districts, take advantage of such opportunities, the more we will have to think about the notion of the common school in America. Which kind of community is shaped through virtual schools? If education is increasingly and exclusively understood as the study of content to prepare students for work, which other institutions address one of the primary goals of the common school: the building of a democratic society (Bellah et al. 1991)?

Again and again, it seems that those of us involved in making instructional and policy decisions are confronted with one central question: How do we keep an eye on what connects knowledge and people? How do we preserve the unity of knowledge in an in-depth learning process that often requires specialization? And how do we preserve or rearrange the way in which we organize the lives of individuals in groups? Humans are not loners—we are social beings. We always connect with others. If such connections are not to be at the expense of others, our environments need to be shaped accordingly. If school addresses this aspect of education as socialization less and less, we need to look elsewhere for that need.

These are just some of the trends that deserve careful deliberation. Technological changes always have consequences that extend far beyond their immediate applications. We are not saying that any of these consequences are inherently good or bad, but traditional understandings of schooling, learning, instruction, and assessment are challenged by them. Some of our most daunting work as educators is to plan ahead and anticipate what may lie ahead of us. Education in the industrial society had to be different from education in an agrarian society. We can safely assume that education in the technological society has to be different from education in the industrial society. The great debate in progressivism was much concerned with that switch; the great debate that will lead educators through technology-based changes in society still lies ahead of us.

In the past, a "school" was generally defined as a building. In the 21st century, schools will become nerve centers, with walls that are porous and transparent connecting teachers, students, and the community to the wealth of knowledge that exists in the world.

American Association of School Administrators (1999, 3)

REFLECTION

- What needs to happen in your school to improve the planning of a connected curriculum?
- What are some good practices in your school?
- Do you see the need for a systemic or organizational change to make connected learning a reality? If you do, what are your reasons? If not, what are your reasons for that assumption?
- Other questions?

Practical Suggestions on Using This Guide

15

Throughout this guide we have suggested numerous reasons why connections and meaning are necessary ingredients in improving learning and achievement. We have also provided capsule and extended strategies that can be adapted and used in your instructional delivery to make your classroom more brain compatible, connected, and invigorating. Our suggestions on how to align what you teach with how you assess learning are based on best practices in Wisconsin schools. Commentary on the importance of technology and the visual and performing arts reinforces the necessity to employ divergent tools and perspectives in developing the range of choices we make in keeping students to construct knowledge.

Hopefully the ideas developed in these chapters will reinforce what we do well and stimulate new thinking. To do so, however, we need your personal help in advocating for change.

It can be as simple as sharing these approaches with a friend, teaching partner, or unit. Face-to-face interaction is a key in discussing the relative merits of new ideas. Take that first step in implementing a new instructional design together. Make it a small step. A two- or three-day lesson is appropriate. Once this has proved successful, build on it. You will be rewarded by your collective efforts.

It can be as complex as working with teachers and administrators to foster systemic change over an extended period of time. Our suggestions provide a blueprint for that transformation. Please make your building and district decision makers aware of its practical suggestions in addressing standards, interdisciplinary learning, and student performance. In doing so, emphasize that as instructional leaders they have a range of alternatives on how this document can be used within a building or across a district.

These applications might include the following:

- Reconfigure the guide format to meet individual school priorities. The value of this guide is in its parts as well as its entirety. Feel free to use chapters of the guide as you deem appropriate. An example might be to focus on the chapters dealing with technology, meaningfulness, and connections and discuss their impact on a school improvement plan or long-term technology blueprint.
- Use the guide as the next step in implementing a standards-based curriculum. If your district is like most others in the state, you have spent long hours aligning your curriculum to the state-assessed and non-state-assessed subjects that have published content and performance standards. The result,

in many cases, is a fragmented curriculum seemingly moving in numerous directions. This guide offers advice on how to draw those crosscurrents together into an attainable, realistic, interconnected framework.

☐ Assess your school's or district's compliance with teaching and learning strategies presented and illustrated in the guide. Consider the positive acknowledgment that will come when teachers can document that what they have been doing is worthy of recognition and replication. Remember that change can partly be defined as doing more of what you already do.

☐ Emphasize that this guide is open to existing initiatives that can be addressed within its flexible design. By definition, the dynamics of change require adaptation. Current priorities within your building or district do not have to be set aside to concentrate on something new. Rather, they can maintain their integrity *within* this interconnected framework.

☐ Suggest that the guide can be broken down into a two-year in-service package. Individual topics and suggestions made in the document can become the focal point of professional growth activities that last approximately eight weeks. In the process, teachers should have the opportunity to discuss pertinent ideas that directly impact their teaching philosophy while being exposed to additional educational resources that challenge ingrained assumptions about how students learn.

☐ Include connected learning strategies as part of a differentiated professional development scheme. Lasting educational change occurs one classroom and one school at a time. A committed cohort of teachers must have the opportunity to participate in a variety of growth opportunities that are an integral part of a comprehensive staff development menu. Action research projects, portfolios for educators, professional writing, and conference presentations are ways for educators to research, document, and share their expertise about developing a standards-based, meaningful, connected curriculum.

☐ Reaffirm the importance of connected learning to student achievement. What students can do with what they know is the essential purpose for teaching and learning. At a time of increased pressure to do more, we must be reminded of the centricity of that purpose.

☐ Model what you preach. Meaningful learning connects what the learner, in this case the teacher, already knows to new content, information, and skills. What a unique opportunity to develop staff development options that start from this premise in nurturing further familiarity and application of a basic tenet of connected learning!

☐ Emphasize that connecting what and how we teach is not another add-on to a never-ending list of transiting new ideas. Instead, this is an open-ended, evolving dynamic that remodels and reshapes deep-seated assumptions about learning that we can no longer validate.

☐ Postulate that focusing on connected learning will build stronger communication and collaboration among educators. A common focus on standards, performance assessment, technology, meaning making, and connectiveness brings staff members throughout the school and across the district together to collectively engage in activities that will promote student learning.

Additional Assistance

The authors of this guide are committed to working with you in your attempts to improve student achievement by connecting curriculum with relevant, meaningful, real-world linkage. *Planning a Connected Curriculum* is a traditional response to the needs of Wisconsin teachers. Contact the DPI or each author individually to arrange for in-services, to ask for more information, or to offer new suggestions.

Connecting the Curriculum Web Site

We are also preparing a Web site for further illustration and information. Check http://www.dpi.state.wi.us for more details. Visitors will have a chance to ask questions and add comments.

Concluding Notes

The forms on the following pages may prove useful in assessing teacher, school and district projects in connecting the curriculum. The suggestions in the "evidence" column on the scoring guides should be adpated in discussions among teachers and administrators. "Choosing a Theme" and "Hallmarks of a Connected Curriculum" offer another opportunity to reflect on proposals throughout this book. Remember that this book can only have an impact through reflective adaptations by teachers, administrators, parents and students.

Teacher Scoring Guide

Classroom Evidence	Advanced	Proficient	Basic	Minimal	Comments
1. Conscious efforts are made to link instructional focus and assessments to real-world situations.					
2. Attempts are made to positively engage emotions in instructional design.					
3. Efforts are extended to establish connections between academic standards from more than one discipline.					
4. Major emphasis is placed on conceptual or thematic learning.					
5. Performance tasks are included in a comprehensive assessment package.					
6. Students can spontaneously explain why learning should be meaningful and connected.					
7. Teacher can articulate to parents and stockholders specific expectations associated with a standard-based, connected curriculum.					
8. The teacher has the flexibility to vary the length and quantity of curriculum content on a day-to-day basis.					
9. Commonly identified standards are reinforced in every subject area.					
10. Examples of exemplary students' work are displayed throughout the classroom.					

School Scoring Guide

Schoolwide Evidence	Advanced	Proficient	Basic	Minimal	Comments
Commonly identified standards and skills are reinforced throughout the school.					
Performance tasks are included in an identified standards-based assessment package.					
Instructional focus and assessments are based on real-world experiences.					
Emphasis is placed on utilizing community resources in instructional design.					
The school vision or mission identifies the importance of meaningful connected learning.					
Time, resources, and support are given to connecting academic standards from more than one discipline.					
For every assignment, project, or evaluation, explicit expectations for proficient work are identified.					
Ongoing quality in-service time is allocated for the development of an evolving standards-based connected curriculum.					
Information literacy is infused as a primary component in all discipline frameworks.					
Examples of exemplary students' work are displayed throughout the school.					

District Scoring Guide

District Evidence	Advanced	Proficient	Basic	Minimal	Comments
The district uses multiple methods of assessment for districtwide accountability.					
Commitment to standards and connected learning are criteria in K–12 district hiring practices.					
The district annually publishes best practices in connecting learning to real-world situations.					
The district authorizes schools and teachers to modify curriculum to emphasize interconnectiveness in learning and application.					
The district mission statement and philosophy acknowledge the link between standards and connected, meaningful learning.					
The district encourages the participation of community resources in instructional design and delivery.					
The district provides time, resources, and support to implement interdisciplinary initiatives to connect learning.					
The district recognizes the creative efforts of administrators and teachers in connecting learning to the lives of its students.					
A district technology plan identifies the importance of information literacy in all disciplines.					
The district expects that all classrooms will establish meaningful connections between identified tested standards.					

Choosing a Theme

Use the checklist below to ensure both the selection of an educationally sound theme and its fit with school and school district goals.

_____ Theme is relevant to students: they can find and construct personal meaning.
_____ Theme is standards based.
_____ Theme supports school goals.
_____ Theme addresses learning outcomes found across grades.
_____ Theme is important enough to be worth the time and effort.
_____ Theme is not so broad that everything fits.
_____ Theme has substance and application to real-world events.
_____ Theme is age appropriate for all students.
_____ Theme facilitates integrated, higher-level thinking and flows logically into several subject areas.
_____ Theme has substantial depth that provides for powerful learning experiences that go beyond factual recall.
_____ Theme lends itself to multiple firsthand experiences.
_____ Theme relates to the "here and now" rather than the "there and then."
_____ Relevant resources are available.
_____ Theme provides opportunities for student choice.

Hallmarks of a Quality Connected Curriculum

It is

- Substantive
- Authentic
- Connected to emotions
- Challenging and meaningful
- Collaboratively planned and assessed
- Connected to standards
- Correlated with to school goals
- Sensitive to diverse learning preference and multiple intelligences
- Conceptual or thematic

And it

- Promotes deeper understanding through student inquiry
- Utilizes knowledge and skills from different disciplines

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